

# WORKING P A P E R

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## Characteristics Associated with the Early Identification of Children with Special Needs in California

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## Executive Summary

The proper and prompt identification of children with special needs, coupled with an appropriate course of treatment and educational plan, is essential to the academic progress of these children. Early identification allows children to receive the aid they need to succeed in school and in their future lives as productive members of society. This aid is especially important for economically disadvantaged children, who are likely to have reduced access to medical care and limited family resources to “catch up” if they fall behind in their academic progress.

A first step in understanding and improving the mechanism for the appropriate identification of children with special needs is to uncover factors that may be influencing the timing of identification. In an ideal world, children with special needs would be identified as early and accurately as possible. In reality, certain districts and individuals are better than others at identifying students with these needs. Systematic patterns in the timing of identification may exist in relation to the demographic characteristics of students, the types of special needs they exhibit, and the district or geographical location in which they reside.

This study investigates the factors associated with the early identification of children with special needs in California. It was conducted in response to a request by the First 5 California Children and Families Commission. The study compares children identified with special needs prior to kindergarten entry with those identified after kindergarten entry, and how the two groups vary by disability type, demographic characteristics, and geographical location. In addition, possible explanations for the variation are offered. The study uses data from the California Department of Education (CDE) on all children receiving CDE services for special needs in the state. The findings point to systematic demographic differences in early identification that need to be addressed in early childhood policies and further research. Several demographic patterns emerged with regard to the early identification of children with special needs in California. These can be briefly summarized as follows:

- Disabilities such as speech or language impairment or autism tend to be identified earlier than others. Specific learning disability tends to be diagnosed after kindergarten entry, and emotional disturbance tends to be diagnosed during adolescence and high school.
- Girls are less likely to be identified early than boys.
- African American children are less likely to be identified early than children in other racial/ethnic groups, despite high overall special needs identification rates.
- English learners are less likely to be identified early than non-English learners.

- Children in particular areas of the state, such as the San Joaquin and Inland Empire regions, are less likely to be identified early than children in other parts of the state.
- District characteristics are related to early identification. Children in small or rural districts are less likely to be identified early than children in large or urban districts. The percentages of African-American, Asian, and free-and-reduced-lunch-eligible students in a district are positively related to the likelihood that a child is identified early whereas the percentage of Hispanic students in a district is negatively related to this likelihood.

These findings represent new information regarding patterns of early identification. The study is limited, however, in that it can identify patterns but not causes. As such, it does not offer immediate implications for interventions that address the policy goal of improving the rate and accuracy of early identification. However, it identifies vulnerable subpopulations on which to focus efforts to improve these rates—i.e., girls, African Americans, English learners, and children in particular regions or types of districts—and discusses possible causes for several of these patterns. In addition, it briefly summarizes various types of policies that might be pursued to understand and address the causes of differences.

Prior to the present study, little had been known about patterns of early identification of children with special needs. This study has helped fill this gap and identified particular subpopulations of children who appear less likely to have their special needs identified early than others. Building upon this study, further investigation into the dynamics of early identification through research, experimentation, and rigorous evaluation will point the way to an effective policy agenda.

## Introduction

The proper and prompt identification of children with special needs, coupled with an appropriate course of treatment and educational plan, is essential to the academic progress of these children. Early identification allows children to receive the aid they need to succeed in school and in their future lives as productive members of society. This aid is especially important for economically disadvantaged children, who are likely to have reduced access to medical care and limited family resources to “catch up” if they fall behind in their academic progress.

A first step in understanding and improving the mechanism for the appropriate identification of children with special needs is to uncover factors that may be influencing the timing of identification. In an ideal world, children with special needs would be identified as early and accurately as possible. In reality, certain districts and individuals are better than others at identifying students with these needs. Systematic patterns in the timing of identification may exist in relation to the demographic characteristics of students, the types of special needs they exhibit, and the district or geographical location in which they reside.

In response to a request by the First 5 California Children and Families Commission, we conducted a study of the factors associated with the early identification of children with special needs in California. Specifically, we looked at differences in whether children were identified with special needs prior to or after kindergarten entry and how this varied by disability type, student characteristics, and geographical location. In addition, we suggest possible explanations for the variation. The study uses data from the California Department of Education (CDE) on all children receiving CDE services for special needs in the state. Our findings point to systematic demographic differences in early identification that need to be addressed in early childhood policies and further research. A limitation of the study is that the data do not allow for a definitive exploration of the causes. The study is therefore descriptive in nature and contributes to the knowledge base on the topic of early identification by providing new contextual information.

This report is organized as follows. First, we review prior research on the early identification of children with special needs. Next, we describe our data and methods, and then provide a detailed descriptive analysis of demographic patterns in early identification. In our concluding section, we summarize our findings, offer possible interpretations, discuss policy implications, and provide recommendations for further study and an approach to developing a policy agenda aimed at promoting early identification.

## Background

This section covers prior research and current policy related to the identification of children with special needs relevant to the issue of the timing of identification.

### PRIOR RESEARCH

Prior research indicates that children with disabilities derive substantial benefits from the early identification of their special needs. There is a large body of health and education research on early intervention for children who are at risk or have established developmental disorders.<sup>1</sup> Whether the children exhibit obvious developmental problems (e.g., deafness, visual impairments) or more subtle symptoms that are often associated with learning disabilities, the evidence indicates that correct identification and appropriate treatment at the earliest possible stage can improve the children's cognitive, educational and social outcomes.<sup>2</sup>

For example, a study of early intervention with children who are deaf and hard of hearing found a statistically significant correlation between the age of treatment and language outcomes at age five – children who received services earliest (e.g., 11 months) demonstrated significantly better vocabulary and verbal reasoning skills at five years of age than did the children identified at a later age (Moeller, Wynn & Mullick, 2003). Similar results exist for autism and other moderate to severe disorders (Butter, Wynn & Mullick, 2003). Success with early intervention has been demonstrated for mild disabilities as well. Studies of children with reading disabilities have shown that appropriate early intervention and remediation can bring about substantial educational gains (Torgeson et al., 2001).

In addition, families report satisfaction with early intervention services. Childhood disabilities impose substantial financial and emotional strains on families as they struggle to offset or ameliorate developmental problems for their children. Early intervention may offset some of these problems and allow parents to focus on more general developmental issues for their children. Findings from a national longitudinal study on preschool children with special needs suggest that most families report highly positive experiences with early intervention programs (Bailey et al., 2004a, Bailey et al.,

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<sup>1</sup> Guralnick, Michael J. (Ed.) *The effectiveness of early intervention*. (Baltimore: Paul H. Brookes), 1997; Ramey, Craig T., and Sharon Landesman Ramey. "Early Intervention and Early Experience," *American Psychologist*, Vol. 53, No. 2, February 1998; pp. 109-120. These summarize a selection of studies across the range of disorders that have been documented in the last two decades.

<sup>2</sup> Ramey and Ramey, 1998; Guralnick, Michael J. "Effectiveness of Early Intervention for Vulnerable Children: A Developmental Perspective." *American Journal on Mental Retardation*, vol. 102, January 1998; pp. 319-345.



2004b). Nearly three-fourth of parents interviewed reported that early intervention had had a large impact on their child's development.

The likelihood that a child with special needs is identified early is influenced by a variety of factors. The primary factor is disability type (Reschly, 1996). While easily detectable disorders such as deafness, visual impairments and Down syndrome can be identified before, at, or soon after birth, disorders such as emotional disturbance and specific learning disabilities may not become apparent until later in development. Therefore, parents and pediatricians or other medical personnel play a central role in identifying needs that can be detected early while later identifications involve educators who observe more subtle symptoms in children in the classroom setting (Bailey et al., 2004).

The subset of children with mild disabilities, such as learning disabilities, warrants attention for its size and potential for early identification and intervention. Learning disability diagnosis rates have risen 233 percent in the past 20 years as compared with a 13 percent growth rate for all other disability categories in the last two decades (Horn & Tynan, 2001). In investigating this phenomenon, researchers have found that many of the identifications occur in later grades when it becomes apparent that poor language skills preclude learning in other content areas (Lyon et al., 2001). These findings suggest that children with learning disabilities might derive substantial benefits from early detection and treatment of their problems, before they fall behind in school. Delayed identification of learning disability problems may not only harm learning outcomes but may also have important consequences for childhood self-esteem and social adjustment.

Several researchers contend that early identification and intervention related to mild disabilities may reduce the need for later services. Both the consensus report of the National Research Panel (National Institute of Child Health and Human Development, 2000) and the evidence-based report of the National Reading Council (Snow et al., 1999) support this view and point to many studies that demonstrate program effectiveness when children with learning disabilities are identified and treated at kindergarten or first grade.

Some researchers, however, criticize this position on the basis that the current practices of early identification and intervention are fraught with errors, leading to misidentification and incorrect labeling that can do more harm than good.<sup>3</sup> In the case

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<sup>3</sup> Dr. James Ysseldyke, former director of the National Center of Educational Outcomes at the University of Minnesota, asserted that over 80 percent of all school children in the United States could qualify as having a specific learning disability under one definition or another. Cited in Robert Worth, "The

of ADHD, studies have shown that about 50 percent of preschoolers identified as difficult to manage with ADHD-like behaviors did not display significant problems by the time they entered first grade (Campbell, 1997). Thus, if the potential for misidentification is greater for young children than for older children, early identification might not necessarily be helpful. While the concern for misidentification may be valid, it does not diminish the potential for early identification and intervention to improve the lives of children in cases in which disabilities are correctly identified and treated. It is unknown, however, the extent to which mislabeling would occur in very young children if developmental screenings were to be administered on a large scale to children prior to kindergarten entry.

Apart from disability type, a further source of variation in identification rates—and one that is possibly related to disability type—is gender. Researchers report that a majority—generally about two-thirds—of all special needs students are male (Markowitz et al., 2006; CDE, 2005; Hebbeler et al., 2004; Wagner & Blackorby, 2002; Mardor & Cox, 1991; Doren et al., 1996; Wagner et al., 1991). Much of the disproportionate representation of males is reportedly due to their high rates of identification in the learning disability and emotional disturbance categories—two categories with broadly defined eligibility criteria (Kratovi & Baily, 1986). Several hypotheses have been advanced to explain the gender difference. Physiological or maturation differences between males and females may exist, stemming from differences in chromosomal structure that may render males more susceptible to abnormalities (Harmon, Stockton & Contrucci, 1992, cited in Office of Special Education Programs, 1998), differences in brain structure that may influence the location of phonological and other processes (Hayden-McPeak, Gaskin & Gaughan, 1993 and Shaywitz, 1996, cited in Office of Special Education Programs, 1998), or differences in the development of stress impulse control, small muscle development, and language skills (Harmon et al., 1992, cited in Office of Special Education Programs, 1998). Non-physiological hypotheses to explain the gender difference include biases among school teachers, manifested in a greater interaction between teachers and boys (Sadker, Thomas & Sadker, 1980, cited in Kratovil & Bailey, 1986) and a greater divergence between the dominant school culture and male as opposed to female behavior, stemming from the fact that teachers are primarily female (Kedar-Volvodas, 1983, cited in Office of Special Education Programs, 1998). Additional biases may stem from divergent expectations for males and females, both on the part of teachers (Gottlieb,

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Scandal of Special Education," *Washington Monthly* (June 1999): 34-38; See also Speece, D. L., and L. P. Case. (2001) "Classification in context: An alternative approach to identifying early reading disability." *Journal of Educational Psychology*, vol. 93, pp. 735-749.

1987) and parents. Another hypothesis advanced in the literature focuses on gender biases in disability definitions and in the tools used to screen for disabilities. Concerns have been advanced that tests for emotional disturbance do not address depressive or internalizing behaviors more prevalent among girls as much as they do externalizing behaviors that are more prevalent among boys (Caseau, Luckasson & Kroth, 1994).

Another source of variation in patterns of identification is related to the race and ethnicity of children. Markowitz et al. (2006), in a study of a nationally representative sample of children aged 3 to 5 with disabilities, found that African-American children represented 11 percent of the special needs population but 15 percent of the general population, whereas Hispanic children represented 22 percent of the special needs population and 20 percent of the general population and white children represented 67 of the special needs population and 58 percent of the general population. Once children enter the school system, however, it appears that public schools place a disproportionate number of minority students—particularly African Americans—into special education programs. In 1992, African-American students accounted for 16 percent of the total U.S. student population, but represented 32 percent of students identified for mild mental retardation, 29 percent of students diagnosed with moderate mental retardation, and 24 percent of students in programs for serious emotional disturbance (Ladner & Hammons, 2001). In California in 2004-2005, African-American children constituted 12 percent of the school-aged special needs population but 8 percent of the general student population. White children constituted 37 and 32 percent of these two groups, respectively. In contrast, Hispanic children constituted 44 and 46 percent of these two groups (CDE, 2006).

Hypotheses to explain racial/ethnic differences center around health differences related to poverty and differential access to high-quality health care. Research indicates that minorities, families with limited income, and families with less-educated mothers tend to report more difficulty accessing health care in general and, in particular, the services related to special needs in the early years (Newacheck, Hung & Wright, 2002).

Markowitz et al. (2006) found that among children aged 3-5 with disabilities, African-American children were more likely to live in poorer households and had significantly lower birth weights—a risk factor associated with subsequent health problems. Also, health researchers have observed that certain methods of identification are less effective in screening minorities than others.<sup>4</sup>

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<sup>4</sup> According to one study, the CSHCN screener (survey to identify children with special health care needs) under-identified African American and Hispanic children among Title XXI enrollees in Florida (Shenkman et al., 2001).

In addition to the individual characteristics of children, external economic factors, such as accountability systems, service costs, and funding allocation policies have an impact on identification rates. The literature suggests that identification may not always be motivated by the interests of students and that some potential for over-identification may exist. Figlio and Getzler (2002) found that schools tended to classify low income and previously low performing students as disabled at higher rates following the introduction of a test-based accountability regime. Cullen (2003) found that fiscal incentives explained as much as 40 percent of the growth in the classification of students as disabled in Texas in the early to mid 1990s. Greene and Forster (2002) found that variation across states in identification rates was significantly related to the type of funding allocation system, the two primary types of systems being census-based or “lump-sum” systems that allocate special education funding solely on the basis of population numbers and “bounty” systems that allocate funding on the basis of service costs. The cost of serving children with special needs varies greatly by disability (Parrish et al., 2003, Chambers, 1999), but little is known about the impact of these variations on the identification of particular disabilities. Similarly, the cost of identifying and treating disabilities before and after kindergarten entry may vary but little is known about the impact of these cost differentials on the timing of identification.

## **CURRENT POLICY**

The provision of early intervention services by the states to children with special needs has been a national policy under part H (now part C) of the Individuals with Disabilities Education Act (IDEA) since 1986. Before then, it was up to individual states to decide whether and how to provide these services. Since then, states have come a long way in building and improving their early intervention programs, although much remains to be learned about their impact and factors that influence their effectiveness.

In California, the Department of Developmental Services (DDS) is responsible for IDEA Part C and the CDE is responsible for Part B. Part C refers to infants and toddlers from birth to three years old, and Part B refers to children and youths between the ages of three and 22. The provision of services is sustained at the local level by a host of agencies including childcare centers, local educational agencies, preschools, regional centers, and Special Education Local Planning Areas (SELPA).

The State of California recognizes the importance of providing early education services through the California Education Code Sections 56425-56432. Section 56425.5 states that, “...early education programs for infants identified as individuals with exceptional needs...can significantly reduce the potential impact of many disabling conditions, and positively influence later development when the child reaches school age.”

The DDS runs 21 regional centers throughout the state, and these are responsible for serving individuals of all ages with developmental disabilities.<sup>5</sup> As part of their function and in accordance with the Early Intervention Services Act, the regional centers coordinate outreach efforts to find infants and toddlers aged 0 through 2 years old who are either disabled or are at risk of being disabled. Such children are located through hospitals (for example, neonatal intensive care units), pediatricians, and other points of contact. Services are based on a medical model of special needs that include cognitive, language, motor, social, and adaptive skills. The types of services provided by the DDS include day programs, out-of-home support, transportation, in-home respite, miscellaneous services, health care, and out-of-home respite.

The CDE runs the more than 100 SELPAs throughout the state to coordinate efforts to locate and serve children aged 3 and older. The Local Education Agencies (LEAs) within the SELPAs are required to locate children with disabilities and provide services.

Infants and toddlers served through the regional centers generally transition to a school district within a SELPA at age three. In general, a transition meeting with parents and parties from both agencies is held prior to the child's reaching three years of age, and, unless parents refuse, a school assessment is later administered. At age three, the child begins receiving special education services. The types of services provided through the SELPAs are based on an educational model of special needs.

It is important to note that some school districts have infant and toddler programs for specific disabilities and that regional centers may provide services such as respite care or after school programs to children or families of children aged three and older. Thus the division between the DDS and CDE is not exclusively age-based. It is also important to note that the strategies adopted by each regional center or LEA are variable and may influence the proportion of children who are identified prior to kindergarten. As a result, early identification of students with disabilities is influenced by variables not easily tracked by either the DDS or the CDE.

Nationally, there are several accountability measures specific to preschool students. A new requirement in IDEA 2004 is that each State Education Agency submit a State Performance Plan (SPP), which is a six-year (2005-2011) blueprint outlining annual benchmarks and six-year targets for 20 indicators. Three specific indicators cover preschool students and families: assessment, the delivery of services in the least restrictive environment, and the Part C-to-Part B transition. Furthermore, the U.S. Office of Special Education Programs (OSEP) funds the Early Childhood Outcomes

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<sup>5</sup> The DDS is responsible for administering the Lanterman Developmental Disabilities Services Act and the Early Intervention Services Act.

Center to assist states with the development of early childhood outcome measures and to comply with the SPP reporting requirements.

The reauthorization of the IDEA in 2004 also focused greater attention on early intervention for specific learning disabilities, which are generally identified once students enter school. The goal of early intervention is to provide intervening services to students earlier to reduce the amount of time that students with learning disabilities experience academic failure before getting assistance. It is too early to determine the impact the federal movement on early intervening services will have on the proportion of students identified prior to kindergarten or on subsequent special education enrollment.

## **Data**

### **CASEMIS DATA**

The primary source of data used in this study is the California Special Education Management Information System (CASEMIS). The Special Education Division of the CDE collects the data housed in this system. The CASEMIS data are restricted, and to safeguard the privacy of individuals, the State protects the identity of the students included in the dataset. We therefore performed all analyses on site at the CDE using de-identified data.

The data consist of student-level records for all California students identified with special needs who are receiving special services through the CDE. The data do not include infants and toddlers served exclusively through DDS. The only infants and toddlers included in the data are those for whom the CDE provides services—for example through a school district infant and toddler program, but these represent a minority of the children from birth through two years of age who receive some type of service. The majority of these children do not appear in the CASEMIS data until the child turns three.

The data are collected twice annually from the more than 100 SELPAs throughout the state—in December and June, with the June data providing complete information on children with special needs in the school year. We used data collected in June of each year for six consecutive years, from 2001 through 2006. The CASEMIS data include several key groups of variables that are used in our analysis:

### **Disability Category**

There are 14 disability categories, each represented by an acronym that we will use in the tables and figures presented in the report. The categories are mental retardation (MR), hard of hearing (HH), deafness (DEAF), speech or language impairment (SLI),

visual impairment (VI), emotional disturbance (ED), orthopedic impairment (OI), other health impairment (OHI), established medical disability (EMD), specific learning disability (SLD), deaf-blindness (DB), multiple disability (MD), autism (AUT), and traumatic brain injury (TBI).

The definitions used for these categories are included in the appendix. Here we note that five of the relatively rare disabilities have been traditionally referred to as “low incidence” disabilities, and these include deaf-blind, deaf, hard of hearing, orthopedic impairment, and visual impairment. These disabilities tend to be more clearly detectable than others. Traumatic brain injury and multiple disabilities are also relatively small categories that are fairly easy to detect. The remaining categories—mental retardation, speech or language impairment, emotional disturbance, specific learning disability, other health impairment, autism, and established medical disability (a category that refers specifically to infants and toddlers)—tend to be more subjectively diagnosed.

### **Student Demographics**

Student characteristics recorded in the data are age, gender, race/ethnicity, English learner status, home language, residency status (e.g., parent or guardian, foster home), and current grade in school. The data also include an identifier for the district in which the child is served.

### **Special Education Identification and Participation**

Participation data include the date of entry into special education. The grade variable contains categories for infants, preschool, kindergarten, each year from grades 1-12, “ungraded,” and “21+/Transition.” Using the date of entry into special education, we were able to isolate children identified in the current year. Then using the grade and age variables, we were able to differentiate between children identified with special needs before and after kindergarten entry in that year.

A word of caution is necessary in discussing the entry date variable. The variable is subject to measurement error. A child who transfers from one SELPA to another may not be correctly tracked in the system. The new SELPA may enter the date at which the child enters its own system as the entry date rather than investigate and record the prior entry date as they are instructed to do. The magnitude of this problem is unknown.

In addition, as mentioned above, the CASEMIS data do not contain records on infants and toddlers served exclusively by the DDS. Thus a child who entered the state system through the DDS but did not receive services from the CDE is not recognized in the CASEMIS data until he or she reaches the age of three and only if the child then begins to receive services from the CDE. In that case, the entry date in CASEMIS is recorded as

age three and the disability category to which the child is assigned is one of the categories used for identification purposes by the CDE.

It is important to note that the disability categories used by the DDS do not map directly onto those used by the CDE in many cases. In addition, approximately 8 percent of infants and toddlers served by the DDS are identified as “at risk” for disabilities but are not diagnosed with a specific disability. In addition, no unique student identifier exists. Thus it would be difficult to append the two datasets together to obtain a reliable count of children in the overall system with the same types of needs. In response to federal reporting requirements, the CDE attempts to match children in previous years of the DDS to new entrants to the CDE system. The State of California State Performance Plan for Individuals with Disabilities Education Act of 2004 (2005) reports that approximately 67 percent of children served in Part C transitioned to Part B before their third birthday during the 2003-2004 year.

## **OTHER DATA**

In addition to the CASEMIS data, we used district-level information from the California Standardized Testing and Reporting (STAR) Program on enrollment, the percentage of children who were free and reduced lunch eligible, the percentage of children in various racial/ethnic categories, and urban-suburban-rural status.

We also used combinations of Metropolitan Statistical Area groupings to form nine regions in the state: Bay Area region, Inland Empire region, Los Angeles region, Orange region, Sacramento region, San Diego region, San Joaquin region, Santa Barbara region, and Rural (i.e., the remaining land area not included in the metropolitan areas).<sup>6</sup>

Last, we used California population estimates from the Public Use Microdata Sample (PUMS).<sup>7</sup> These data contained information on population totals by age, gender, and race/ethnicity.

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<sup>6</sup> The Bay Area region consisted of Alameda, Contra Costa, Marin, Monterey, Napa, San Francisco, San Mateo, Santa Clara, Santa Cruz, Solano, and Sonoma counties. The Inland Empire region consisted of San Bernardino and Riverside counties. The Los Angeles region consisted of Los Angeles county. The Orange region consisted of Orange county. The Sacramento region consisted of Butte, El Dorado, Placer, Sacramento, Shasta, Sutter, Yolo, and Yuba counties. The San Diego region consisted of San Diego and Imperial counties. The San Joaquin region consisted of Fresno, Kern, Madera, Merced, San Joaquin, Stanislaus, Tulare, and Kings counties. The Santa Barbara region consisted of San Luis Obispo, Santa Barbara, and Ventura counties.

<sup>7</sup> Population data originated from the American Community Survey (<http://www.census.gov/acs/www/>), a nation wide survey conducted by the U.S. Census Bureau. It collects information such as basic demographic information, income, commute time to work, home value, and other important data at individual level on an annual basis. The survey provides estimates for national level and state level. The



## Methods

Our analytic strategy employs descriptive and multivariate techniques. In our descriptive analysis, we provide cross-tabulations displaying the relationships between early identification and the demographic characteristics of students, the types of disabilities they exhibit, and the district or geographical location in which they reside. The multivariate analysis then investigates sources of variation in greater detail, by allowing us to look at differences in early identification across demographic groups after adjusting for other factors.

The multivariate analysis consists of a set of probit regressions, in which the outcome or “dependent” variable is the dichotomous indicator called “early\_id.” Early\_id equals 1 if a child has been identified prior to entering the K-12 system, and it equals 0 if a child has been identified during or after entry into kindergarten. The probit model is used instead of a traditional regression approach because the key outcome (early identification of a student disability) is a discrete outcome. The probability of early identification is modeled as a vector of characteristics associated with each child

$$Early\_id_{ij}^* = \alpha + x_{ij}\beta + d_{ij}\gamma + z_{ij}\delta + r_{ij}\tau + u_{ij},$$

where  $Early\_id^*$  represents the underlying probability of early identification for the  $i^{th}$  student in the  $j^{th}$  school district,  $x$  is a vector of student demographic characteristics (gender, ethnicity, English learner status, and residential status),  $d$  is a vector of disability indicators,  $z$  is a vector of characteristics associated with the student’s school district, and  $r$  is a vector of geographic region indicators. The estimated parameters vectors are  $\alpha$ ,  $\beta$ ,  $\gamma$ ,  $\delta$ , and  $\tau$ . These represent the magnitudes of the relationships of the various covariates to the probability that a child with special needs will be identified prior to kindergarten. The links between the various covariates and early identification are conditional on one another, so the model isolates the role of individual factors like ethnicity or gender, controlling for other factors in the model.

The model is a latent variable model in the sense that the “true” probability of early identification is unobservable—we only observe empirically whether or not the student is identified early. The observed outcome is defined as  $Early\_id=1$  if  $Early\_id^*>0$  and  $Early\_id=0$  otherwise. The model is then estimated by probit regression

$$\Phi(\alpha + x_{ij}\beta + d_{ij}\gamma + z_{ij}\delta + r_{ij}\tau) = \int_{-\infty}^{\alpha + x_{ij}\beta + d_{ij}\gamma + z_{ij}\delta + r_{ij}\tau} \frac{1}{(2\pi)^{1/2}} \exp(-t^2 / 2) dt ,$$

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Public Use Microdata (PUM) sample is used. In California, the sample size for 2005 was 334885, which is about 3 times as much as that of 2001-2004, and about 9 times as much as that of 2000.

where  $\Phi$  is the cumulative normal function.

The interpretation of coefficient in the model is complicated somewhat by the fact that the parameter vectors reflect changes in a standardized normal variate. The change in the probability of the outcome with respect to the  $k^{\text{th}}$  student demographic factor is

$$\frac{\partial}{\partial x_{ik}} \Phi(\alpha + x_{ij}\beta + d_{ij}\gamma + z_{ij}\delta + r_{ij}\tau) = \phi(\alpha + x_{ij}\beta + d_{ij}\gamma + z_{ij}\delta + r_{ij}\tau) \beta_k,$$

where  $\phi$  is the normal density function. The density function can be evaluated for any set of values of  $x$ , but one normally evaluates the function for a representative or average special education student. This derivative is the marginal contribution of the  $k^{\text{th}}$  factor on the outcome.

In our models, many of the variables are discrete, so it is useful to consider the change in the discrete variable relative to the excluded outcome. For example, the association of being female with early identification is the difference in the probability of early identification of a female and male special education student with otherwise identical characteristics.

Since the identification patterns of children within the same district are likely to be correlated, all analyses adjust the standard errors of the estimated parameters for the clustering of students within districts.

## Findings

The following are findings on population identification rates and factors associated with the early identification of children with special needs. We begin with simple cross-tabulations and then discuss a multivariate analysis that highlights the influence of particular factors while holding others constant.

### POPULATION IDENTIFICATION RATES

Prior to analyzing patterns related to early identification of special needs, we present a brief overview of population identification rates to provide contextual information. Using the PUMS data in combination with the CASEMIS data, we calculated rates of identification of children with special needs in the population as a whole.

According to the PUMS estimates, there were 11,955,178 individuals aged 0 through 22 years old in California in the 2004-2005 school year. According to CASEMIS, there were 845,294 individuals in this age group identified with special needs. Thus approximately

7.1 percent of the children in California aged 0-22 have been identified with special needs.<sup>8</sup>

Table 1 shows information on the percentage of all children in California identified with special needs for the academic years 2000-2001 through 2004-2005 according to disability category. Identification rates varied considerably by disability and over time. Of the 14 disability categories, the largest are speech or language impairment and specific learning disability. Speech or language impairment represents 47 percent of the total number of children identified with special needs, and specific learning disability represents 32 percent of the total. Autism is the fastest growing identified disability, followed by other health impairment.

Population identification rates also varied considerably by gender and race/ethnicity, as shown in Table 2. Boys are identified with special needs at approximately twice the rate of girls. African American children are identified at higher rates than children of other races, and Filipino children are identified at the lowest rate.

## **Disability**

The above population identification rates were calculated including all children in the special needs population—i.e., those recently identified and those identified in previous years. Our analysis of patterns of early identification now focuses instead on the subgroup of special needs children who are newly identified by the CDE in each year under consideration. By focusing on the new entrants to the special education system, we are able to determine whether children are identified before or after kindergarten and analyze trends in early and late identification by disability, demographic characteristics, and geographical location.<sup>9</sup>

Figure 1 illustrates the number of new entrants to special education during the 2005-2006, by disability category. The figure also indicates the fraction of special needs children who were identified before kindergarten entry. The largest disability categories for new entrants overall are speech or language impairment and specific learning disability.

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<sup>8</sup> The incidence of special education is often reported for school age children in grades K through 12. In California, about 10 percent of the K-12 population receives some special education services. Since our analysis focuses on early intervention, the definition in the text includes children who have not yet started kindergarten. In addition, the CDE has responsibility for providing special education services until age 22, so these older students are also included in the incidence definition used here.

<sup>9</sup> When similar analyses are conducted on other subgroups (such as the population of post-kindergarten special needs children identified prior to or following the age of 5), similar results are found to those presented for the population of new entrants.

The disability categories with the largest numbers of children identified prior to kindergarten entry are speech or language impairment, autism, mental retardation, specific learning disability, and other health impairment. Speech or language impairment, however, far outweighs the others with respect to the number of children identified.

Table 3 shows that, of the children identified before kindergarten entry, more than 68 percent were diagnosed with speech or language impairment. The second largest disability category of children identified early was autism—more than 9 percent. In contrast, the largest category of children identified after kindergarten entry was composed of children diagnosed with specific learning disability (43 percent). The large size of this category for school-age children is not surprising since learning disabilities are generally diagnosed after a child's ability to learn has been observed in the school setting. Speech or language impairment is the second largest category of children diagnosed after kindergarten entry (38 percent).

Figures 2A and 2B offer greater detail regarding the relationship between age of entry and various disability categories. The first of these figures shows a large difference in the age of entry for speech or language impairment and specific learning disability. In addition, the figures show a spike in the diagnosis of children with speech or language impairment and several other medium-sized disability categories at age three. For speech or language impairment, there is also a large spike at age five, presumably due to exposure to teachers at kindergarten entry.

## **Gender**

There were 81,783 boys and 40,431 girls newly identified with special needs by the CDE in California during the 2005-2006 school year (see Figure 3). Thus, boys made up two thirds of the new entrants to the special needs population in that year. Thirty percent of the boys and 26 percent of the girls were identified prior to kindergarten entry. The percentage of children identified early has grown over the last six years for both sexes. Figure 4 displays growth patterns by gender and shows that the rate of growth in early identification has been higher for boys than for girls.

Some of the difference in the age of identification between boys and girls stems from gender differences in disabilities. Figure 5 shows the proportion of new entrants to special education who are boys in each disability category for the 2005-2006 school year. The figure shows that the number of boys and girls diagnosed as deaf or deaf-and-blind are virtually the same, and it is not widely dissimilar for those diagnosed with multiple disabilities, orthopedic impairment, or hardness of hearing. On the other hand, boys outnumber girls to a large degree in diagnoses such as autism, traumatic brain injury, other health impairment, speech and language impairment, emotional disturbance, and

specific learning disability. As we saw above, speech or language impairment tends to be diagnosed early and represents the largest disability category, overall. The proportion of boys versus girls in speech or language impairment, therefore, drives part of the gender difference in early identification.

### **Race/Ethnicity**

Of the children newly identified with special needs by the CDE in 2005-2006, approximately 29 percent were identified prior to entering kindergarten, but the percentage differed by race/ethnicity (see Table 4 and Figure 6). Higher percentages of Asian and Filipino children and a slightly higher percentage of Hispanic children were identified early (37, 35, and 30 percent, respectively). Among white children, 29 percent were identified early. Lower than average percentages of Pacific Islander and American Indian children were identified early—25 and 24 percent, respectively. Only 19 percent of African American children were identified early. These percentages varied over time. Figure 7 shows that the percentage of Asians and Filipinos identified early grew noticeably over the last six years.

In light of the relatively high overall special needs identification rates for African American children seen previously in Table 2, it is surprising that African American children are less likely to be identified early than other racial/ethnic groups. We found that African American children identified with special needs were more likely than others to be diagnosed with specific learning disability—a disability, as we have seen, that is diagnosed primarily after children have entered school. Forty-four percent of African American children newly identified with special needs in 2005-2006 were diagnosed with specific learning disability compared with 32 percent of all newly identified children. Thus, disability type is a possible driving factor in the differences we observe in early identification by race and ethnicity.

An additional explanation may be found in demographic differences in the age distribution. If the share of Hispanic children in the population who were under the age of five were higher than the corresponding share of African American children, then it would be logical to expect that the percentage of children identified early would represent a larger share of children newly identified with special needs for Hispanics than for African Americans. To check whether this explanation might have some validity, we computed population statistics for the proportion of individuals aged 0-22 who were under the age of 5 within different racial/ethnic groups. Table 5 displays these proportions. Higher proportions of young children were estimated for Hispanic children, which could partially account for the higher early identification percentages for this racial/ethnic group than for other groups and for the increase in early

identification over time. It does not explain, however, the early identification differences between African Americans and whites or other racial/ethnic groups.

### **Residential Status**

Table 6 shows the distribution of new entrants to special education according to their residential status. More than 96 percent lived with at least one parent. Children in foster homes represented a little more than 1 percent of new entrants. Children in foster homes were more likely to enter special education prior to kindergarten than children in other categories.

### **Region**

Figure 8 shows the number of children newly identified with special needs in 2005-2006 in various regions of California. The largest number of children identified with special needs came from the Los Angeles region, as would be expected due to the large population in the region. As can be seen in Table 7, the Los Angeles region also had the largest percentage of children identified before kindergarten entry. Figures 9A and 9B show trends in the percentage of newly identified children who were identified before kindergarten entry. As can be seen from the figure, all regions demonstrated an increase in the percentages of children identified prior to kindergarten entry, but the increase was greatest for the Los Angeles region.

### **MULTIVARIATE ANALYSIS**

The multivariate probit regression analysis sheds more light on the factors influencing early identification. The regression determines the separate relationships of different characteristics to early identification after adjusting for others. Simple cross-tabulations of early identification rates by groups, such as race/ethnicity, may obscure the relationship of other characteristics in producing observed patterns. The multivariate analysis highlights persistent underlying patterns by showing the relationship of each factor to early identification holding other factors constant.

The model was estimated for different groups of students. First, the model was estimated for *all* children newly identified with special needs in the 2005-2006 school year. Next, the model was estimated separately for different subgroups of newly identified children to see whether model parameters differed across groups. First, it was estimated for particular disability groups. Second, it was estimated separately for boys and girls. Finally, the model was estimated for the four largest ethnic groups (white non-Hispanics, Hispanics, African Americans, and Asians).

The marginal effects from the probit regressions are reported in Tables 8 and 9. We refer to the coefficients in the model as “effects” that contribute to the early identification “rate.” It should be noted at the outset, however, that the model is simply

descriptive and that the rate we refer to is the percentage of newly identified children who are identified early. Therefore the coefficients are not to be interpreted as causal parameters and the rates are not to be interpreted as population incidence rates.

### **Overall Model**

Results from the model that includes all children newly identified with special needs in 2005-2006 are shown in the first column of Table 8. In this model, the covariates consist of disability type, gender, race/ethnicity, English learner status, type of residence, region, and district characteristics.

The early identification rate for girls is about 3 percentage points lower than for boys. This gap represents some narrowing of the five-point gap shown in Figure 4 and indicates that the simple pattern is partly driven by the mix of disabilities and other demographics for boys versus girls.

The results show that early identification rates are about 7 percentage points lower for African American children than for comparable white non-Hispanic students. In contrast, Hispanic and Asian children have early identification rates 3 and 5 percentage points higher, respectively, than white non-Hispanics. Early identification rates for the smaller ethnic groups (Pacific Islander, Filipino, and Native American) are not significantly different from those of white non-Hispanics.

English learners have early identification rates about 7 percentage points lower than those of comparable students with better English skills. About 25 percent of all special education students are English learners, but fewer than 2 percent of white non-Hispanic, African American, and Native American students are English learners. About 48 and 36 percent of Hispanic and Asian special education students, respectively, are English learners. English learners make up 14 percent of the Filipino and Pacific Islander population of special needs children.

The results show that English proficient Hispanic and Asian children have higher early identification rates than do comparable white non-Hispanic students. These positive effects are more than offset, however, for English learners.

Early identification rates are 17 percentage points higher for students living in foster homes than for students living with their parents. In contrast, students in other types of residences have early identification rates about 13 percentage points lower than do students living with parents.

Early identification rates vary dramatically by disability group. Other factors equal, the rate for the early identification of specific learning disability is 36 percentage points lower than for speech or language impairment (the reference category). This difference reinforces the pattern shown in Figure 2A—that many speech or language impairment

students are diagnosed before kindergarten, whereas few specific learning disability students are identified early.

Among other disabilities, the range of variation in early identification is wide. Mental retardation, deafness, orthopedic impairment, established medical disability, multiple disabilities, and autism have early identification rates significantly higher than those for speech or language impairment. Early identification rates for hardness of hearing, visual impairment, and deaf-blindness are similar to those for speech or language impairment. Emotional disturbance, other health impairment, and traumatic brain injury, along with specific learning disability, have early identification rates significantly lower than that of speech or language impairment.

Some geographic variation is evident. Identification rates in the San Joaquin Valley and the Inland Empire are 6 and 8 percentage points lower, respectively, than in the Los Angeles region. Rates for other areas in the state do not differ significantly from those in the Los Angeles region. The implication is that comparable special education students have lower early identification rates in the San Joaquin Valley and the Inland Empire than in all other parts of the state.

District characteristics were also included in the model to adjust for district-level factors that might be related to early identification. The results show that early identification rates are positively related to the percentage of African American and free/reduced lunch students in a district. In contrast, the percentage of Hispanic and English learner students in a district is inversely related to early identification. The results also suggest that economies of scale in early identification may influence rates—early identification is more likely in large and urban districts than in small and rural districts.

### **Disability Groups**

The second, third, and fourth columns in Table 8 show the patterns of early identification for three disability groups: the two largest—speech or language impairment and specific learning disability—and the fastest growing—autism.

Early identification rates are lower for girls than for boys in both of the large disability groups. Girls have rates that are 6 percentage points lower for speech or language impairment and 1 percentage point lower for specific learning disability than for boys. The pattern within the group of children identified with autism is quite different. While 84 percent of the autistic population is made up of boys (see Figure 5), the results indicate that the early identification rate for girls is 6 percentage points higher than for boys. Given the relatively low incidence of autism among girls, it is surprising that the early identification rates are higher than those for boys.



Early identification rates vary considerably by racial/ethnic groups for the different disability groups. Early identification rates are 6, 1, and 7 percentage points lower, respectively, for African Americans diagnosed with speech or language impairment, specific learning disability, and autism than for similarly diagnosed white non-Hispanic children. In contrast, Hispanic children have significantly higher early identification rates than white non-Hispanic children for speech or language impairment and autism. Asian children have significantly higher early identification rates than white non-Hispanic children for specific learning disability and autism. There are few statistically significant differences in early identification rates for Pacific Islander, Filipino, and Native American children. Identification patterns are inherently measured with less precision for these groups because they constitute relatively small shares of the California special education population. The results indicate, however, that early identification rates for specific learning disability are higher for Filipino and lower for Native American children than for white non-Hispanic children.

The low adjusted rates of early identification for African American children are surprising given the relatively high incidence of disabilities in this population. The results indicate that the lower early identification rates across all disabilities are not driven by a high incidence of specific learning disability for African American students. Rather, the early identification rates are consistently lower for African American children across speech or language impairment, specific learning disability, and autism. In contrast, the English proficient Hispanic population shares many of the financial challenges of the African American population, but the early identification rates for English proficient Hispanic children is much higher than for African American children.

English learners have lower early identification rates than English proficient children in each of the four large disability groups. Early identification rates are 8 and 10 percentage points lower for English learners in speech or language impairment and autism than for other children. English learners in the specific learning disability group have early identification rates 1 percentage point lower than for non-English learners.

Early identification rates differ somewhat across geographic regions. Rates for speech or language impairment are 9 to 12 percentage points lower in the Sacramento region, the San Joaquin Valley, and the Inland Empire than in other parts of the state. Surprisingly, the early identification rate for specific learning disability is 31 percentage points higher in rural California than in the urban areas. Early identification of autism is consistent across the state with no statistically significant differences by region.

School district characteristics show fewer significant relationships to early identification than in the overall regression model, most likely due to smaller sample sizes. Where coefficients are significant, the pattern of is similar to that in the overall regression.

## **Gender Differences**

The first two columns of Table 9 show the patterns of early identification for girls and boys separately. Early identification rates for African American girls and boys are 5 and 8 percentage points lower, respectively, than for similar white non-Hispanic girls and boys. Hispanic girls and boys have identification rates 2 and 4 percentage points higher, respectively, than do white non-Hispanic girls and boys. Taken together, the difference in early identification rates between African American girls is 7 percentage points, compared with 12 percentage points for boys.

The highest early identification rates for any ethnic group are for Asians and particularly for Asian girls. The results show that the early identification rates for Asian girls and boys are 6 and 4 percentage points higher than for white non-Hispanics, respectively. The high early identification rates for Asians are surprising, particularly given the low incidence of disabilities among Asian children.

The pattern of early identification by disability is similar in the separate regressions for girls and boys for the largest two disability groups (speech and language impediment and specific learning disability). For example, early identification is 34 percentage points lower for girls with specific learning disabilities than for girls with speech or language impairments, and this gap is 37 percentage points for boys. The gender differences in the early identification rates are relatively large, however, for emotional disturbance and autism. Compared with specific learning disabilities, early identification rates for emotional disturbance for boys is almost 6 percentage points lower than for girls. In contrast, the early identification rate for autistic girls is about 10 percentage points higher than for boys. For most of the other disabilities, the differences in early identification rates in the separate regressions for boys and girls are not particularly noteworthy, given the small sample sizes the disability groups.

The patterns in early identification by geographic region and district characteristics vary little by gender. Regions like the San Joaquin Valley and the Inland Empire, with relatively low early identification rates have consistently low rates for both girls and boys. Similarly, district characteristics have similar effects on the early identification of girls and boys.

## **Ethnic Differences**

The final set of regressions in Table 9 shows how the relationship of demographic characteristics to early identification rates varies across ethnic groups. The results show that gender is not a significant factor for African American and Asian children. The gender gap in early identification is driven by white non-Hispanic and Hispanic children where rates are about 3 percentage points lower for girls than for boys.

Early identification rates for Hispanic and Asian English learners are 7 and 17 percentage points lower, respectively, than for similar students who are proficient in English. The smaller gap for Hispanic children may reflect more general language support in this community, since Spanish is widely spoken in many California communities. Few non-Hispanic whites and African Americans are English learners, but white English learners have early identification rates 10 percentage points lower than white children who are proficient in English.

Regional and district characteristics have similar patterns of early identification across ethnic groups. The relatively low early identification rates in the San Joaquin Valley are primarily driven by low rates for white non-Hispanics and Hispanics, perhaps a reflection of the low shares of African Americans and Asians in this region. The early identification rates are lower in the Inland Empire than in Los Angeles, but the gap is only 2 percentage points for African Americans, compared with 8 to 9 percentage points for other large ethnic groups. District characteristics affecting early identification have similar patterns of significance and magnitude across all ethnic groups.

## **Summary of Findings, Discussion, and Recommendations**

### **SUMMARY OF FINDINGS**

In this study, several demographic patterns have emerged with regard to the early identification of children with special needs in California.

- Disabilities such as speech or language impairment or autism tend to be identified earlier than others. Specific learning disability tends to be diagnosed after kindergarten entry, and emotional disturbance tends to be diagnosed during adolescence and high school.
- Girls are less likely to be identified early than boys.
- African American children are less likely to be identified early than children in other racial/ethnic groups, despite high overall special needs identification rates.
- English learners are less likely to be identified early than non-English learners.
- Children in particular areas of the state, such as the San Joaquin and Inland Empire regions, are less likely to be identified early than children in other parts of the state.
- District characteristics are related to early identification. Children in small or rural districts are less likely to be identified early than children in large or urban districts. The percentages of African American, Asian, and free and reduced lunch eligible students in a district are positively related to the likelihood that a

child is identified early whereas the percentage of Hispanic students in a district is negatively related to this likelihood.

These findings represent new information regarding patterns of early identification. The study is limited, however, in that it can identify patterns but not causes. As such, it does not offer immediate implications for interventions that address the policy goal of improving the rate and accuracy of early identification. It has, however, identified vulnerable subpopulations on which to focus efforts to improve these rates—i.e., girls, African Americans, English learners, and children in particular regions or types of districts. In the next section, we discuss possible causes for several of these patterns.

## DISCUSSION

The following describes possible explanations for the findings.

**Disabilities such as speech or language impairment or autism tend to be identified earlier than others. Specific learning disability tends to be diagnosed after kindergarten entry, and emotional disturbance tends to be diagnosed during adolescence and high school.**

Certain disabilities are diagnosed earlier because their symptoms are more easily detectable at early ages. The cause of the “three-year-old effect” is unknown, however, and may be due to a number of causes. Much of it is likely due to the fact that children transferred from the regional centers to the CDE at age three are given an entry date that reflects the date of transfer. Unfortunately, the data do not flag children who have been previously served by the DDS, and DDS data are not coordinated with CDE data. Thus we do not have access to data that tell us how many entrants at age 3 come through this route. The number of new entrants to the CDE system at age 3 includes some children who were “identified” by the DDS at age 2 in the prior year, at age 1 two years prior, and at age 0 three years prior. However, this “overcounting” of children receiving some type of service in the state that shows up as part of the spike at age three is offset by the “undercounting” of children aged 0 through 2 because those served exclusively by the DDS are not counted. Because children are not identified in the same way by the DDS as they are by the CDE and because the two data systems are not linked, we could not assess the difference between the number of new CDE entrants aged 0 through 3 and the number of newly served children 0 through 3 in the state at a given point in time.

It may also be the case that certain developmental screenings are administered frequently by pediatricians or other health professionals at age three. Other possibilities are that preschool attendance promotes identification or that parents become more aware of developmental issues their children may have at that age, as the children begin

to interact more frequently with other children in day care centers or other group activities. In particular, the development of speech at age three is more apparent.

**Girls are less likely to be identified early than boys.**

Given that the gender difference in early identification persists even after we control for disability type, physiological explanations lose some viability. Physiological differences could still play a role if girls tended to have milder, less obvious forms of particular disabilities than boys. It could be, however, that socialized behavioral differences, attitudes on the part of physicians and other health professionals, or gender bias in screening instruments play a role in delaying the recognition of disabilities in girls.

**African American children are less likely to be identified early than children in other racial/ethnic groups, despite high overall special needs identification rates.**

Even after controlling for disability type, the identification of special needs in African American children occurred later than for other children. This could be explained by high levels of poverty that limit access to health care. If this were the cause, however, then we might expect Hispanic children to experience the same phenomenon. Hispanic children, however, do not appear to experience the same degree of delay in identification. The reasons for the difference in early identification rates between African American and Hispanic children is unclear, given that large percentages of children in each group are economically at risk. Several hypotheses might explain the difference.

One hypothesis is that access to health care may differ for African Americans and Hispanics. Early identification may be hampered for poor families with limited access to health care. Recent evidence suggests that African Americans have much better health insurance coverage in California than do Hispanics (Aguayo et al., 2003). About 28 percent of California Hispanics are uninsured as compared with 9 percent of the African American population. The average access to health care for these groups is, therefore, not consistent with the pattern of early identification across the two ethnic groups. CASEMIS does not include information on the family socio-economic status or health insurance status, so we are unable to assess how differences in health care access affect early identification patterns.

Another hypothesis is that early identification may be aided by preschool attendance, and access to preschool may differ by race/ethnicity. Parents may overlook some developmental problems of their children, and these problems may become evident in a preschool setting when a child is matched with other children of the same age. About 56 and 37 percent of African American and Hispanic children, respectively, attend preschool (Lopez and de Cos, 2004). This evidence does not support the hypothesis.

Alternatively, family structure may play a role. Dual parent families may have more resources than single parent families, so they may have access to better health care, preschool, and other facilities that aid in the early identification of disabilities. Also, single parents may struggle to meet competing work and family time commitments. About 48 percent of African American children live in a single parent family as compared with 19 percent of Hispanic children. High rates of single parenthood in African American families may explain a portion of the gap in early identification rates between African American and Hispanic children. The CASEMIS data do not include information on whether a child comes from a single parent family.

Another hypothesis is that cultural norms, expectations, behavioral differences, and racial bias may play a role. These hypotheses may explain racial-ethnic differences much the same way that they may explain gender differences.

A final hypothesis is that the distribution of the pre- and post-kindergarten population differs for African Americans and Hispanics. As we have seen, this may explain some of the difference, although it does not explain the difference in early identification rates between African Americans and other non-Hispanic racial/ethnic groups.

#### **English learners are less likely to be identified early than non-English learners.**

The lower early identification rates for English learners may stem from the difficulty this group faces in gaining access to special education resources and screening.

Language barriers for the parents of these children may impede the early identification of their disabilities and delay the provision of special education services. In addition, English learners may be identified later because of a lack of qualified screeners who are fluent in languages other than English.

#### **Children in particular areas of the state, such as the San Joaquin and Inland Empire regions, are less likely to be identified early than children in other parts of the state.**

There are several possible explanations for the regional differences in early identification percentages. Differences in the age distribution due to regional demographics may play a role. As noted above in our discussion of racial/ethnic differences, if younger children made up a larger share of the total population aged 0-22 in the Los Angeles region than in other regions, we would expect to see higher percentages of children identified early in this region. Second, there could be differences in the health conditions of people in different regions. Health problems that cause disabilities likely to be identified early may be more prevalent in some regions than others.

Third, regional authorities and institutions play an essential role in conducting and monitoring identification—or “child find” activities. Some institutions may be more

successful than others in performing this task and be quicker to respond to trends in accountability. In addition, since identification involves several institutions, institutions in some regions may be more efficient and well coordinated than others. It may also be the case that advocacy groups may be more effective in some regions than others. In addition, small and rural districts may have a lack of personnel and specialists for identifying special needs.

**District characteristics are related to early identification. Children in small or rural districts are less likely to be identified early than children in large or urban districts. The percentages of African American, Asian, and free and reduced lunch eligible students in a district are positively related to the likelihood that a child is identified early whereas the percentage of Hispanic students in a district is negatively related to this likelihood.**

The fact that the size of the district is positively related to early identification suggests some economies of scale in early detection strategies. Despite the fact that African Americans are less likely to be identified early, districts with higher percentages of African American and poor children are more likely to identify children earlier. Without a finer investigation of rates by district—perhaps through qualitative discussions with various district personnel—it is difficult to develop hypotheses regarding these findings.

## **POLICY IMPLICATIONS AND RECOMMENDATIONS**

In the above paragraphs, we have offered several possible explanations for the existing patterns. In this section, we describe the types of policies that might improve early identification rates and then recommend a strategy for determining their effectiveness and promoting their adoption.

Before discussing possible recommendations, it is useful to summarize the types of policies that can influence early identification rates. Interventions that have the potential to improve early identification rates fall into the following three broad categories: (1) increased points of contact with vulnerable populations, (2) improved screening and assessment practices, and (3) improved institutional supports. Below we give a very brief overview of the types of policies encompassed in these three categories. Because a wide range of such policies exists, this overview is intended as a means of offering examples and not as an exhaustive inventory. In addition, it is important to note that many of the policies described below are currently in place in various forms and locations.

Contact with vulnerable populations might be increased through improved efforts to follow up on problematic births and siblings of children with identified problems and to track these follow-up activities. In addition, points of contacts might increase by expanding outreach efforts in poor communities through, for example, free clinics, mobile medical units, medical house calls, and networking through churches, day care centers, and other organizations. Social workers investigating other issues can also be sources of referral for developmental screening.

In addition, the promotion of preschool attendance may increase early identification rates and affect the differences in early identification by region, although the role of preschool has yet to be determined. Lopez and De Cos (2004) reported that in 2000, approximately half of California's population aged three to five was enrolled in preschool or childcare. Many regional centers and LEAs conduct "child find" activities through preschools and childcare organizations, therefore it is possible that increasing preschool participation would increase early identification.

In addition to these types of targeted policies to increase the extent of screening, more wide-ranging policies could be considered. On the broadest scale, the introduction of universal screening could be promoted through legislative means.

Screening and assessment practices can be improved by increasing the adoption of effective tools. Screening instruments,<sup>10</sup> some of which can be used by parents, can be administered or distributed in numerous contexts, such as through the points of contact mentioned above. It may also be possible to expand the training of health and other professionals to increase their exposure to effective instruments—both for screening and assessment.<sup>11</sup> In addition to improving the dissemination and use of effective tools, the definitions of certain disabilities—particularly broadly defined categories, such as specific learning disability or other health impairment—could be further studied to determine whether more precise categories could be isolated and diagnosed and treated earlier. It may be that certain types of learning disabilities and other health impairments can be caught earlier, before children are observed in school.

A third set of policies focuses upon improving institutional practices. A large number of institutions are involved in finding, diagnosing, treating, and educating young

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<sup>10</sup> Numerous developmental screening instruments exist. Some are parent questionnaires, such as the Parents' Evaluation of Developmental Status (PEDS) and Ages and Stages Questionnaire (ASQ) and can be administered by health professionals or by the parents themselves.

<sup>11</sup> A large number of developmental assessment instruments exist, as well. Examples are the Bayley Scale of Infant Development, the Woodcock-Johnson Tests of Cognitive Abilities, and the Clinical Evaluation of Language Fundamentals. Physicians or other trained personnel generally administer these tests and provide interpretation and report.



children with special needs. As we have mentioned, the DDS and CDE take responsibility for these children in California—the former for children under the age of three and the latter afterwards. Under the aegis of these institutions are many others—regional centers, SELPAs, LEAs, early start programs, etc. Policy can influence the smooth working of these institutions and the transitions from one to the other. Several other institutions participate in the process, as well. The medical community is integrally involved, as are public and private institutions that provide access to health care and health insurance. The educational community responsible for training health care professionals, social workers, teachers, and day care instructors may exert a considerable influence on early identification rates.

Not only is the number of institutions directly or tangentially involved large, the types of practices within these institutions that can affect early identification are numerous, as well. For example, incentive structures related to resource allocation, funding and reimbursement mechanisms, and accountability and monitoring activities all play a role. The federal government plays a prominent role in creating incentives for the medical community and state agencies to increase or decrease efforts in this area. For example, the Center for Medicare and Medicaid Services (CMS) determines the relative value unit (RVU) used to reimburse health care professionals for developmental screening.<sup>12</sup> Similarly, the distribution of federal funds for special education and Title I and rules regarding the inclusion of special education students in assessments to meet national testing requirements related to the No Child Left Behind Act determine large portions of funding flowing to meet the needs of special needs children. Current accountability and monitoring efforts by OSEP, described in the background section above, create incentives for state agencies to identify and serve children with special needs. Variation in the identification and service of young children across and within states, however, indicates that some state and local systems function more smoothly than others.

In addition, better data systems would improve our ability to isolate causes for these patterns. Student identifiers that allow for tracking students over time and linking them to other data that contain information on parental education and other socioeconomic factors would improve our understanding of the relationship of poverty

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<sup>12</sup> The American Academy of Pediatrics reported in 2005 that \$13.64 would be reimbursed to health care personnel who perform screening (American Academy of Pediatrics, 2005, accessed at [http://www.medicalhomeinfo.org/screening/Screen%20Materials/Developmental%20Screening-Testing%20Coding%20Fact%20Sheet\\_1.doc](http://www.medicalhomeinfo.org/screening/Screen%20Materials/Developmental%20Screening-Testing%20Coding%20Fact%20Sheet_1.doc) on November 7, 2006). Dobrez et al. (2006) estimate the cost of developmental and behavioral screening of preschool children in general pediatric practice to be between \$11 and \$82 per screen.

and mobility to early identification. In addition, identifiers that enable students to be linked across agencies would improve our understanding of the full range of early identification and intervention services. More specific data on the area in which the child lives would allow for a greater understanding of the role that neighborhoods play in promoting or hindering access to health screenings. More information on referral patterns would improve knowledge of the types of professionals and institutions that promote early identification. Improved information on the actual costs linked to each child will also shed light on differences across districts and regions in early identification.

Some of these issues are currently being addressed. The CDE has plans to improve its data collection by requiring that SELPAs report referral and improved service delivery information in the coming year. In addition, plans to assign children unique statewide student identifiers are currently underway in the state, and these may, at some point, be linked to CASEMIS data, although it is unclear how soon this will occur.<sup>13</sup> Recent federal reporting requirements have led the CDE to attempt to match records of three-year-old children to prior DDS records using name, gender, and birth date in order to track the percentage of children entering the CDE system who received prior services from the DDS, but this matching process is as yet imperfect. Efforts to improve the tracking of children from regional centers to SELPAs would be useful.

We suggest a two-pronged strategy to develop a policy agenda in a cost-effective manner: (1) conduct further research, (2) conduct pilot studies consisting of randomized interventions accompanied by rigorous evaluation. After these steps have been taken, it will then be possible to introduce large scale interventions with evidence of effectiveness.

Further research would involve both qualitative and quantitative approaches. A first step would be to conduct qualitative research into differences in institutional behaviors in various districts and regions. This would entail interviews with personnel at regional centers, SELPAs, health clinics, school districts, pediatric groups and advocacy organizations to gather information on variation in child find practices, costs of identification and special services, resource allocation and funding practices, responses to test-score information, and the transition from DDH to CDE.

Several types of quantitative studies are also possible. A key issue is whether the differences in early identification reflect differences in early disability screening rates for some groups or regions. Alternatively, some children identified late may have

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<sup>13</sup> See <http://www.cde.ca.gov/ds/sp/cl/> for information on the California Longitudinal Pupil Achievement Data System (CALPADS).

“passed” the same diagnostic screens as children identified early. Under this scenario, differences in early identification across groups and regions might still occur for several reasons. First, the severity and age progression of disabilities might differ across groups. For example, some groups might be predisposed to have fewer speech or language impairment problems than others, or groups might have problems that emerge more slowly as children age. Second, the screens might be more prone to errors for some groups than for others. This could reflect biases in the screens—for example, English learners might inherently be more difficult to screen for speech or language impairment particularly if their first language is not common in California. More research is needed into disability screening incidence for young children to understand whether the patterns of early identification in this research reflect differential access to screening or differences in screening outcomes themselves.

Future studies could also include examining a sub-sample of children with special needs to determine whether those who attended pre-school were more likely to have been identified prior to kindergarten entry. Similarly, the effect of socioeconomic status on early identification could be examined in greater detail for a sub-sample of children with special needs.

Tracking a random sample of children from birth to school can determine access to developmental screenings and factors associated with particular diagnoses. The national dataset Early Childhood Longitudinal Study (ECLS-B)—a longitudinal study of a nationally representative sample of children born in 2001—may provide data to support this study. Otherwise, a similarly structured data collection in California would provide information on the early experiences of children in the state. By over-sampling children with disabilities or risk factors for disabilities (not done in ECLS-B), such a data collection could yield valuable information on this population.

Piloted interventions accompanied by rigorous evaluation would do much to help determine the effectiveness and efficiency of potential policies. Randomized experiments—related, for example, to the use of different screening tools, follow-up procedures, outreach efforts, or fiscal incentives—would provide valuable information regarding the efficacy of particular approaches. In addition, gender and racial/ethnic bias on the part of teachers and health professionals or in particular assessment tools can be studied using social psychology experiments designed to reveal stereotypical attitudes.

Prior to the present study, little had been known about patterns of early identification of children with special needs. This study has helped fill this gap and identified particular subpopulations of children who appear less likely to have their special needs identified early than others. Building upon this study, further investigation into the dynamics of

early identification through research, experimentation, and rigorous evaluation will point the way to an effective policy agenda.

## References

- Aguayo, Jennifer, E. Richard Brown, Michael A. Rodriguez, and Lia Masrgolis, "Important Health Care Issues for California Latinos: Health Insurance and Health Status," UCLA Center for Health Policy Research and the Latino Coalition for a Healthy California. University of California: Los Angeles, CA. January 2003.
- American Academy of Pediatrics, 2005, Developmental Screening/Testing Coding Fact Sheet for Primary Care Pediatricians, accessed at [http://www.medicalhomeinfo.org/screening/Screen%20Materials/Developmental%20Screening-Testing%20Coding%20Fact%20Sheet\\_1.doc](http://www.medicalhomeinfo.org/screening/Screen%20Materials/Developmental%20Screening-Testing%20Coding%20Fact%20Sheet_1.doc) on November 7, 2006
- Bailey, D., Hebbeler, K., Scarborough, A., Spiker, D., & Malik, S. (2004a). First Experiences with Early Intervention: A National Perspective. *Pediatrics* 113(4), 887-96.
- Bailey, D. Scarborough, A., Hebbeler, K., Spiker, D., & Malik, S. (2004b). *Family Outcomes at the End of Early Intervention*. NEILS Data Report No. 6. Menlo Park, CA: SRI International.
- Barkley, R. A. (1997). *Taking charge of ADHD*. New York, NY: Guilford.
- Butter, E.M., Wynn, J., Mullick, J.A. (2003). Early Intervention Critical to Autism Treatment. *Pediatric Annals*, 32(10), 677-684.
- California Department of Education (2006) Pocketbook of Special Education Statistics 2004-2005, CDE Press, Sacramento.
- California Department of Education, *Code of Federal Regulations (CFR), Education, 34 CFR Parts 300 and 303; The Federal Register* Volume 64, No. 48. (March 12, 1999)
- Campbell, S.B. (1997). Behaviour Problems in Preschool Children: Developmental and Family Issues. In T. Ollendick & R. Prinz (Eds.), *Advances in Clinical Child Psychology* (19). New York, NY: New York, Plenum.
- Caseau, D.L., Luckasson, R., & Kroth, R.L. (1994). Special education services for girls with serious emotional disturbance: A case of gender bias? *Behavior Disorders*, 20(1), 51-60.
- Chambers, J. (1999) *The patterns of expenditures on students with disabilities: A methodological and empirical analysis*. In Parrish, T., Chambers, J., & Guarino, C., (Eds.). (1999). *Funding Special Education, Nineteenth Annual Yearbook of the American Education Finance Association*. Thousand Oaks, CA: Corwin Press, Inc.

- Cullen, J.B. (2003) The impact of fiscal incentives on student disability rates. *Journal of Public Economics*, 87, 1557-1589.
- Dobrez, D., Lo Sasso, A., Holl, J., Shalowitz, M., Leon, S., & Budetti, P. (2006) Estimating the Cost of Developmental and Behavioral Screening of Preschool Children in General Pediatric Practice. *Pediatrics*, 108 (4), 913-922.
- Doren, B., Bullis, M., & Benz, M.R. (1996). Predicting the arrest status of adolescents with disabilities in transition. *Journal of Special Education*, 29(4), 363-380.
- Figlio, D.N. & Getzler, L.S. (2002) *Accountability, ability and disability: Gaming the system*. Working Paper 9307. National Bureau of Economic Research. Cambridge, MA.
- Gottlieb, B.W. (1987) Gender differences in cognitive profiles among urban children placed in special education. (ERIC Document Reproduction Service No. ED 387 972)
- Guralnick, M.J. (Ed.). (1997). *The effectiveness of early intervention*. Baltimore, MD: Paul H. Brookes.
- Guralnick, M.J. (1998). Effectiveness of Early Intervention for Vulnerable Children: A Developmental Perspective. *American Journal on Mental Retardation*, 102, 319-345.
- Harmon, J.A., Stockton, T.S., & Contrucci, V.J. (1992) Gender disparities in special education. Madison, WI: Wisconsin Department of Public Instruction.
- Horn, W.F., & Tynan, D. (2001). Time to Make Special Education 'Special' Again. In *Rethinking Special Education for a New Century* (pp. 23-51). Thomas B. Fordham Foundation.
- Kedar-Volvodas, G. (1983). The impact of elementary children's school roles in teacher attitudes: An interactional analysis. *Review of Educational Research*, 53(3), 415-437.
- Kratovi, J. & Bailey, S. (1986). Sex equity and disabled students. *Theory into Practice*, 25(4), 250-256.
- Ladner, M. & Hammons, C. (2001). Special but Unequal: Race and Special Education. In *Rethinking Special Education for a New Century* (pp. 85-110). Thomas B. Fordham Foundation.
- Lopez, E.S. & P. L. de Cos, (2004). *Preschool and Childcare Enrollment in California*. California Research Bureau: Sacramento, CA. January 2004.
- Lyon, G. R., Fletcher, J.M, Shaywitz, S.E., Shaywitz, B.A., Torgesen, J.K., Wood, F.B., Schulte, A., & Olson, R. (2001). Rethinking Learning Disabilities. In *Rethinking*

- Special Education for a New Century* (pp. 259-287). Thomas B. Fordham Foundation.
- Markowitz, J., Carlson, E., Frey, W., Riley, J., Shimshak, A., Heinzen, H., Strohl, J., Lee, H., and Klein, S. (2006). Preschoolers' characteristics, services, and results: Wave 1 overview report from the Pre-Elementary Education Longitudinal Study (PEELS). Rockville, MD: Westat. Available at [www.peels.org](http://www.peels.org).
- Moeller, M. P. (2000). Early intervention and language development in children who are deaf and hard of hearing. *Pediatrics*, 106(3), E43.
- National Institute of Child Health and Human Development. (2000). *The Report of the National Reading Panel: An Evidence-Based Assessment of the Scientific Research Literature on Reading and Its Implications for Reading Instruction*. Bethesda, MD: National Institute of Child Health and Human Development.
- Newacheck, P.W., Hung, Y., & Wright, K.K. (2002). Racial and ethnic disparities in access to care for children with special health care needs. *Ambulatory Pediatrics*, 2(4), 247-254.
- Office of Special Education Programs (1998) *Gender as a factor in special education eligibility, services, and results. Twentieth Annual Report to Congress on the Implementation of the Individuals with Disabilities Education Act*. Washington, DC: Office of Special Education Programs and Rehabilitative Services (OSERS), U.S. Department of Education, pp.II-25 through II-43.
- Parrish, T., Chambers, J., & Guarino, C., (Eds.). (1999). *Funding Special Education, Nineteenth Annual Yearbook of the American Education Finance Association*. Thousand Oaks, CA: Corwin Press, Inc.
- Ramey, C.T., & Ramey, S.L. (1998). Early Intervention and Early Experience. *American Psychologist*, 53(2), 109-120.
- Ramey, C.T., Ramey, S.L., & Guralnick, M.J. (1998). Effectiveness of Early Intervention for Vulnerable Children: A Developmental Perspective. *American Journal on Mental Retardation*, 102, 319-345.
- Reschly, D.J. (1996). Identification and assessment of students with disabilities. *Future Child*, 6, 40-53.
- Shaywitz, S.E. (1996). Dyslexia. *Scientific American*, 275(5), 98-104.
- Shenkman, E., Vogel, B., Brooks, R., Wegener, D.H., & Naff, R. (2001). Race and Ethnicity and the Identification of Special Needs Children. *Health Care Financing Review*, 23(2), 35-51.

- Snow, C., Burns, M.S., Griffin, P. (1998). *Preventing Reading Difficulties in Young Children*. Washington, D.C.: National Academic Press.
- Speece, D. L., & Case, L. P. (2001). Classification in context: An alternative approach to identifying early reading disability. *Journal of Educational Psychology*, 93, 735-749.
- Torgesen, J. K., Alexander, A.W., Wagner, R.K., Rashotte, C.A., Voeller, K., Conway, T. & Rose, E. (2001). Intensive Remedial Instruction for Children with Severe Reading Disabilities: Immediate and Long-Term Outcomes from Two Instructional Approaches. *Journal of Learning Disabilities*, 34, 33-58.
- Wagner, M., Blackorby, J., Cameto, R., & Newman, L. (1993) What makes a difference? Influences on postschool outcomes of students with disabilities. Menlo Park, CA: SRI International.
- Worth, R. (1999). The Scandal of Special Education. *Washington Monthly*, 34-38.



## Appendix

### Disability Categories

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**Mental Retardation (MR):** Mental Retardation means significantly subaverage general intellectual functioning, existing concurrently with deficits in adaptive behavior, and manifested during the developmental period, that adversely affects a child's educational performance. (34 CFR Sec. 300.7(c)(6)).

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**Hard of Hearing (HH):** Hard of Hearing means hearing, impairment, whether permanent or fluctuating, that adversely affects a child's educational performance, but that is not included under the definition of "deaf in this section.

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**Deafness (DEAF):** Deafness means a hearing impairment that is so severe that the child is impaired in processing linguistic information through learning, with or without amplification, which adversely affects educational performance. (34 CFR Sec. 300.7(c)(3))

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**Hearing Impairment (HI):** Hearing Impairment is a federal category of disability, which includes both hard of hearing and deaf individuals as defined above.

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**Speech or Language Impairment (SLI):** Speech or Language Impairment means a communication disorder such as stuttering, impaired articulation, language impairment, or a voice impairment, that adversely affects a child's educational performance. (34 CFR Sec. 300.7(c)(11))

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**Visual Impairment (VI):** Visually Impaired, including blindness means an impairment in vision that, even with correction, adversely affects a child's educational performance. The term includes both partially seeing and blind children. (34 CFR Sec. 300.7(c)(13)).

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**Emotional Disturbance (ED):** Emotional Disturbance means a condition exhibiting one or more of the following characteristics, over a long period of time and to a marked degree, that adversely affects educational performance:

- A. An inability to learn which cannot be explained by intellectual, sensory, or health factors;
- B. An inability to build or maintain satisfactory interpersonal relationships with peers and teachers;
- C. Inappropriate types of behavior or feeling under normal circumstances;
- D. A general pervasive mood of unhappiness or depression; or
- E. A tendency to develop physical symptoms or fears associated with personal or school problems.

The term (ED) includes schizophrenia. The term does not apply to children who are socially maladjusted, unless it is determined that they have an emotional disturbance. (34 CF Sec. 300.7(c)(4)).

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**Orthopedic Impairment (OI):** Orthopedic Impairment means a severe orthopedic impairment that adversely affects a child's educational performance. The term includes impairments caused by congenital anomaly (e.g., clubfoot, absence of some member, etc.), impairments caused by disease (e.g., poliomyelitis, bone tuberculosis, etc.), and impairments from other causes (e.g., cerebral palsy, amputations, and fractures or burns which cause contractures). (34 CFR Sec. 300.7(b)(6) Sec. 300.7(c)(8))

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**Other Health Impairment (OHI):** Other Health Impairment means having limited strength, vitality or alertness, due to chronic or acute health problems such as a heart condition, tuberculosis, rheumatic fever, nephritis, asthma, sickle cell anemia, hemophilia, epilepsy, lead poisoning, leukemia, or diabetes, which adversely affects a child's educational performance. (34 CFR Part 300.7 (c) (9)).

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**Established Medical Disability (EMD):** A disabling medical condition or congenital syndrome that the individualized education program (IEP) team determines has a high predictability of requiring special education and services. (CA Ed Code, Section 56441.11(d)) [Note: This eligibility category is only applicable for children ages 3-5]

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**Specific Learning Disability (SLD):** Specific Learning Disability means a disorder in one or more of the basic psychological processes involved in understanding or using language, spoken or written, that may manifest itself in an imperfect ability to listen, think, speak, read, write, spell, or to do mathematical calculations, including such conditions as perceptual disabilities, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia. The term does not include learning problems that are primarily the result of visual, hearing, or motor handicaps, of mental retardation, of emotional disturbance or of environmental, cultural, or economic disadvantage. (34 CFR Sec. 300.7(c)(10)).

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**Deaf-Blindness (DB):** Deaf-Blindness means concomitant hearing and visual impairments, the combination of which causes such severe communication and other developmental and educational needs that they cannot be accommodated in special education programs solely for children with deafness or children with blindness. (34 CFR Sec. 300.7(c)(2)).

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**Multiple Disabilities (MD):** Multiple Disabilities means concomitant impairments (such as mental retardation-blindness, mental retardation-orthopedic impairment, etc.,) the combination of which causes such severe educational needs that they cannot be accommodated in special education programs solely for one of the impairments. The term does not include deaf-blind children. (34 CFR Sec. 300.7(c)(7)).

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**Autism (AUT):** Autism means a developmental disability significantly affecting verbal and non-verbal communication and social interaction, generally evident before age three, which adversely affects educational performance. Other characteristics often associated with autism include, engagement in repetitive activities and stereotyped movements, resistance to environmental change or change in daily routines, and unusual responses to sensory experiences. The term does not apply if a child's educational performance is adversely affected primarily because the child has an emotional disturbance. A child who manifests characteristics of "autism" after age three, that child could be diagnosed as having "autism" if the criteria in the above paragraph are satisfied. (34 CFR Sec. 300.7(c)(1)).

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**Traumatic Brain Injury (TBI):** Traumatic Brain Injury means an acquired injury to the brain caused by an external physical force, resulting in total or partial functional disability or psychosocial impairment, which adversely affects educational performance. The term applies to both open or closed head injuries resulting in impairments in one or more areas, such as cognition; language; memory; attention; reasoning; abstract thinking; judgment; problem-solving; sensory, perceptual and motor abilities; psychosocial behavior; physical functions; information processing; and speech. The term does not include brain injuries that are congenital or degenerative, nor brain injuries induced by birth trauma. (34 CFR Sec. 300.7(c)(12))

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SOURCE: California Special Education Management Information System (CASEMIS), Technical Assistance Guide, 2005-06 Edition, California Department of Education, Special Education Division, Fall 2005.

**Table 1 - Percent of California Population Aged 0 through 22 Identified with Various Disabilities by the CDE**

	<b>2000-2001</b>	<b>2001-2002</b>	<b>2002-2003</b>	<b>2003-2004</b>	<b>2004-2005</b>	<b>Percent change 2000-2005</b>
MR	0.40	0.41	0.42	0.43	0.42	5.05
HH	0.06	0.07	0.07	0.07	0.08	20.65
DEAF	0.04	0.04	0.04	0.04	0.04	-5.49
SLI	1.84	1.88	1.91	1.94	1.94	5.11
VI	0.04	0.05	0.05	0.05	0.05	2.61
ED	0.28	0.30	0.31	0.32	0.33	19.14
OI	0.14	0.14	0.14	0.15	0.15	4.07
OHI	0.23	0.26	0.30	0.34	0.37	61.10
EMD	0.00	0.00	0.01	0.01	0.01	
SLD	3.59	3.58	3.56	3.45	3.33	-7.33
DB	0.00	0.00	0.00	0.00	0.00	19.17
MD	0.07	0.06	0.07	0.06	0.06	-10.63
AUT	0.14	0.18	0.21	0.25	0.29	105.16
TBI	0.01	0.02	0.02	0.02	0.02	26.92
All	6.85	7.00	7.12	7.12	7.07	0.00

SOURCE: CASEMIS, June, 2000-2005 and PUMS 2000-2005.

NOTE: The disability categories are mental retardation (MR), hard of hearing (HH), deafness (DEAF), speech or language impairment (SLI), visual impairment (VI), emotional disturbance (ED), orthopedic impairment (OI), other health impairment (OHI), established medical disability (EMD), specific learning disability (SLD), deaf-blindness (DB), multiple disability (MD), autism (AUT), and traumatic brain injury (TBI).

NOTE: The most recent PUMS data available are for the 2005 calendar year. We took the average PUMS estimates for 2004 and 2005 to create match the school year 2004-2005 data from CASEMIS. Therefore, we could not include a column for the 2005-2006 school year.

**Table 2 – Percent of California Population Aged 0 through 22 Identified with Special Needs by the CDE, by Gender and Race/Ethnicity**

	<b>2000- 2001</b>	<b>2001- 2002</b>	<b>2002- 2003</b>	<b>2003- 2004</b>	<b>2004- 2005</b>	<b>Percent Change 2000-2005</b>
<b>Gender</b>						
Boys	8.94	9.17	9.31	9.31	9.27	3.79
Girls	4.66	4.73	4.82	4.82	4.75	2.06
<b>Race/Ethnicity</b>						
White	7.28	7.18	7.40	7.39	7.12	-2.16
African-American	11.43	12.86	12.47	11.94	12.30	7.67
Hispanic	6.50	6.71	6.89	6.91	7.00	7.66
Filipino	3.30	3.37	3.49	3.61	3.51	6.41
Asian	3.48	3.62	3.61	3.79	3.88	11.44
Pacific Islander	8.39	9.37	9.10	9.48	9.99	19.04
Native American	5.46	7.39	7.64	7.72	7.81	42.94
<b>All</b>	<b>6.85</b>	<b>7.00</b>	<b>7.12</b>	<b>7.12</b>	<b>7.07</b>	

SOURCE: CASEMIS, June, 2000-2005 and PUMS 2000-2005.

NOTE: The most recent PUMS data available are for the 2005 calendar year. We took the average PUMS estimates for 2004 and 2005 to create match the school year 2004-2005 data from CASEMIS. Therefore, we could not include a column for the 2005-2006 school year.

**Table3 – Relationship between Disability Type and Early Identification among New Entrants to the California Special Education Population, 2005-2006 School Year**

	<b>Total Number Identified</b>	<b>Percent of All Identified</b>	<b>Number Identified Before Kindergarten Entry</b>	<b>Percent of Total Identified Before Kindergarten Entry</b>	<b>Percent of Those Identified Before Kindergarten Entry in Category</b>	<b>Percent of Those Identified After Kindergarten Entry in Category</b>
SLI	57,025	46.66	23998	42.08	68.56	37.87
SLD	39,123	32.01	1616	4.13	4.62	43.01
OHI	7,873	6.44	1547	19.65	4.42	7.25
AUT	4,875	3.99	3219	66.03	9.20	1.9
ED	4,765	3.90	27	0.57	0.08	5.43
MR	3,548	2.90	1696	47.80	4.85	2.12
OI	1,388	1.14	953	68.66	2.72	0.5
HH	1,311	1.07	709	54.08	2.03	0.69
MD	739	0.60	422	57.10	1.21	0.36
VI	583	0.48	283	48.54	0.81	0.34
DEAF	490	0.40	252	51.43	0.72	0.27
TBI	231	0.19	40	17.32	0.11	0.22
EMD	229	0.19	219	95.63	0.63	0.01
DB	34	0.03	22	64.71	0.06	0.01
All	122,214	100.00	35,003	28.64	100.00	71.36

SOURCE: CASEMIS, June, 2005-2006.

NOTE: The disability categories are mental retardation (MR), hard of hearing (HH), deafness (DEAF), speech or language impairment (SLI), visual impairment (VI), emotional disturbance (ED), orthopedic impairment (OI), other health impairment (OHI), established medical disability (EMD), specific learning disability (SLD), deaf-blindness (DB), multiple disability (MD), autism (AUT), and traumatic brain injury (TBI).

**Table 4 – Relationship between Ethnicity and Early Identification among New Entrants to the California Special Education Population, 2005-2006 School Year**

	<b>Total Number Identified</b>	<b>Percent of All Identified</b>	<b>Number Identified Before Kindergarten Entry</b>	<b>Percent of Total Identified Before Kindergarten Entry</b>	<b>Percent of Those Identified Before Kindergarten Entry in Category</b>
Hispanic	57,646	47.17	17143	29.74	48.98
White	42,292	34.60	12159	28.75	34.74
African-American	12,812	10.48	2449	19.11	7.00
Asian	5,867	4.80	2167	36.94	6.19
Filipino	1,996	1.63	699	35.02	2.00
Native American	953	0.78	225	23.61	0.64
Pacific Islander	648	0.53	161	24.85	0.46

SOURCE: CASEMIS, June, 2005-2006.



**Table 5 – Percentage of 0-4 Year-old Children in the Overall California Population Aged 0-22 Years Old**

	<b>White</b>	<b>African American</b>	<b>Hispanic</b>	<b>Asian</b>	<b>Filipino</b>	<b>Pacific Islander</b>	<b>Native American</b>
2000-2001	20	20	23	20	17	21	22
2001-2002	21	20	23	20	18	22	17
2002-2003	20	20	23	21	18	22	17
2003-2004	20	20	24	22	20	21	20
2004-2005	20	21	24	21	19	21	20
2005-2006	21	21	24	21	18	19	17

SOURCE: PUMS 2000-2005.

**Table 6 - Relationship between Residential Status and Early Identification among New Entrants to the California Special Education Population, 2005-2006 School Year**

	<b>Total Number Identified</b>	<b>Percent of All Identified</b>	<b>Number Identified Before Kindergarten Entry</b>	<b>Percent of Total Identified Before Kindergarten Entry</b>	<b>Percent of Those Identified Before Kindergarten Entry in Category</b>
Parent	118,038	96.58	34,184	29	97.66
Foster family home	1,306	1.07	488	37	1.39
LCI	1,234	1.01	48	4	0.14
Other	822	0.67	266	32	0.76
Residential facility	376	0.31	5	1	0.01
Incarcerated_institution	349	0.29	0	0	0.00
State hospital	31	0.03	0	0	0.00
Developmental center	31	0.03	0	0	0.00
Non-state hospital	27	0.02	12	44	0.03

SOURCE: CASEMIS, June, 2005-2006.

**Table 7 - Relationship between Region and Early Identification among New Entrants to the California Special Education Population, 2005-2006 School Year**

	<b>Total Number Identified</b>	<b>Percent of All Identified</b>	<b>Number Identified Before Kindergarten Entry</b>	<b>Percent of Total Identified Before Kindergarten Entry</b>	<b>Percent of Those Identified Before Kindergarten Entry in Category</b>
Los Angeles region	31,256	28.05	10,320	33.02	32.31
Inland Empire region	15,136	13.59	3,519	23.25	11.02
San Joaquin region	14,238	12.78	4009	28.16	12.55
Bay Area region	12,560	11.27	3,548	28.25	11.11
San Diego region	12,166	10.92	3480	28.6	10.9
Orange region	10,515	9.44	2788	26.51	8.73
Sacramento region	8,409	7.55	2119	25.2	6.63
Santa Barbara region	4,815	4.32	1445	30.01	4.52
Rural areas	2,320	2.08	713	30.73	2.23

SOURCE: CASEMIS, June, 2005-2006.

**Table 8 - Patterns in Early Identification among New Entrants to the California Special Education Population in the 2005-2006 School Year by Disability Group: Marginal Effects from Probit Regressions**

		Disability		
	Overall	SLI	SLD	AUT
Boy	a	a	a	a
Girl	-0.028*	-0.058*	-0.009*	0.063*
Ethnicity				
White Non-Hispanic	a	a	a	a
African American	-0.067*	-0.060*	-0.013*	-0.072*
Hispanic	0.033*	0.037*	-0.002	0.072*
Asian	0.050*	0.025	0.029*	0.090*
Pacific Islander	-0.025	-0.045	-0.006	-0.044
Filipino	-0.004	-0.037	0.026*	0.007
Native American	-0.028	-0.033	-0.006*	0.029
English Learner	-0.067*	-0.080*	-0.011*	-0.097*
Residential Status				
Parental home	a	a	a	a
Foster family home	0.166*	0.237*	0.001	-0.300*
Other residential	-0.134*	-0.073	-0.014*	-0.512*
Disability				
SLI	a	NA	NA	NA
MR	0.027*	NA	NA	NA
HH	0.042	NA	NA	NA
DEAF	0.102*	NA	NA	NA
SLD	-0.358*	NA	NA	NA
VI	0.001	NA	NA	NA
ED	-0.229*	NA	NA	NA
OI	0.198*	NA	NA	NA
OHI	-0.153*	NA	NA	NA
EMD	0.661*	NA	NA	NA
DB	0.184	NA	NA	NA
MD	0.128*	NA	NA	NA
AUT	0.173*	NA	NA	NA
TBI	-0.157*	NA	NA	NA
Geographic Region				
Los Angeles	a	a	a	a
Bay Area	0.035	0.014	0.003	0.012
Sacramento	-0.033	-0.094*	0.010	0.022
San Joaquin Valley	-0.057*	-0.125*	-0.012*	-0.084

Rural	0.051	-0.020	0.309*	-0.183
Inland Empire	-0.077*	-0.117*	-0.013*	-0.057
Santa Barbara	0.004	-0.004	-0.002	-0.108
San Diego	0.015	0.016	-0.010*	-0.077
Orange	0.036	0.025	-0.003	0.031
District Characteristics				
African American (%)	0.004*	0.005*	0.001*	0.000
Asian (%)	0.002*	0.001	0.001*	0.001
Hispanic (%)	-0.001*	-0.002	0.000	0.000
Other race/ethnic (%)	-0.002*	-0.001	-0.001	-0.002
English Learner (%)	-0.005*	-0.005*	0.000	-0.004*
Free/reduced lunch (%)	0.002*	0.004*	0.000*	0.002*
District enrollment	0.000*	0.000*	0.000*	0.000*
District urban	0.082*	0.081	0.024	0.103
District suburban	0.058	0.058	0.034	0.067
Early Identification Rate	0.287	0.420	0.044	0.661

NOTES: <sup>a</sup> indicates omitted reference category. NA indicates that the cell entry is not applicable. \* indicates statistical significance at the .05 level. Source: CASEMIS, June, 2005-2006. The disability categories are mental retardation (MR), hard of hearing (HH), deafness (DEAF), speech or language impairment (SLI), visual impairment (VI), emotional disturbance (ED), orthopedic impairment (OI), other health impairment (OHI), established medical disability (EMD), specific learning disability (SLD), deaf-blindness (DB), multiple disability (MD), autism (AUT), and traumatic brain injury (TBI).

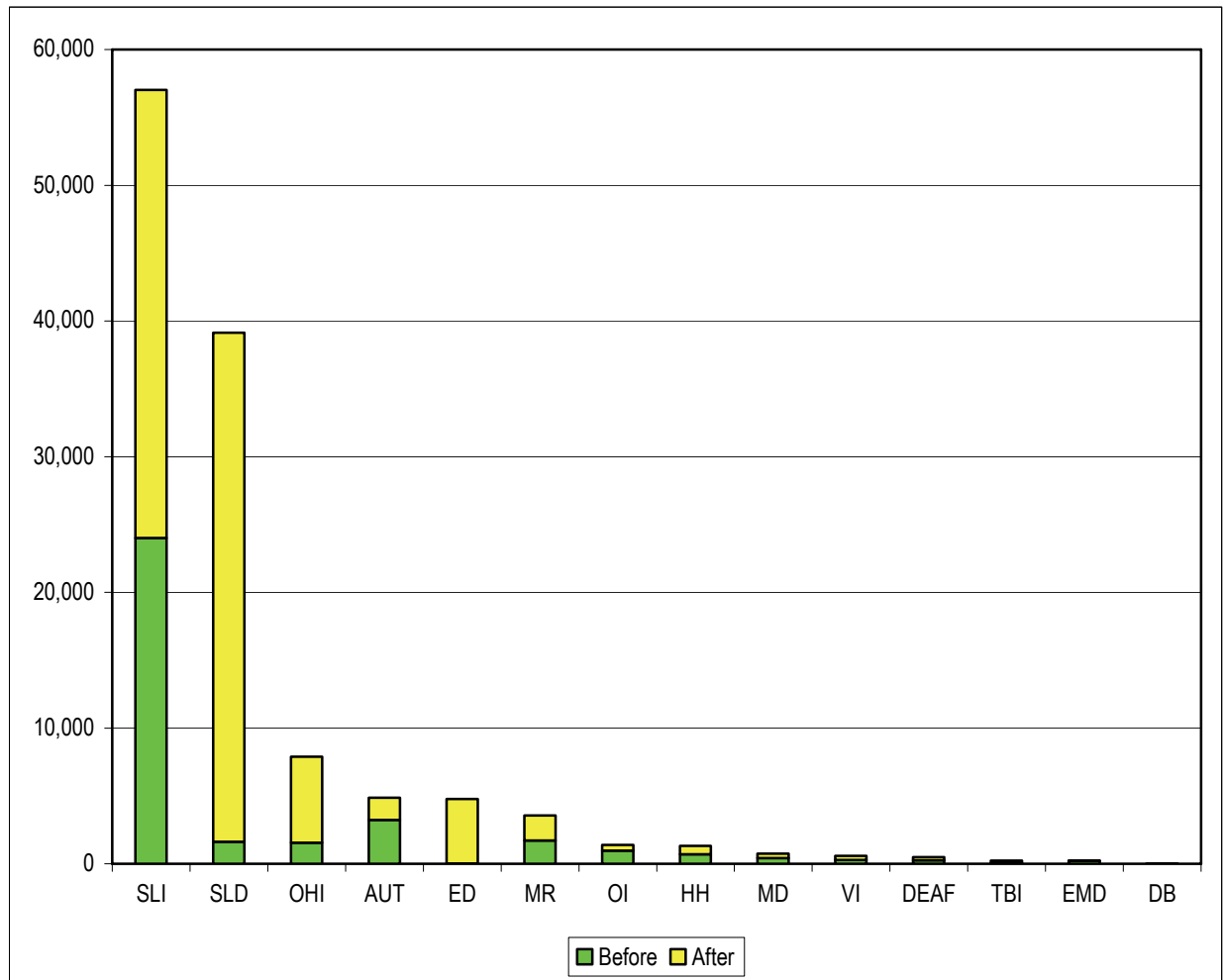
**Table 9 - Patterns in Early Identification among New Entrants to the California Special Education Population in the 2005-2006 School Year by Gender and Race/Ethnicity: Marginal Effects from Probit Regressions**

	Gender		Ethnicity			
	Girls	Boys	White	Hispanic	African American	Asian
Boy	NA	NA	a	a	a	a
Girl	NA	NA	-0.035*	-0.033*	-0.004	-0.002
Ethnicity	a	a	NA	NA	NA	NA
White Non-Hispanic	-0.049*	-0.077*	NA	NA	NA	NA
African American	0.023*	0.037*	NA	NA	NA	NA
Hispanic	0.064*	0.043*	NA	NA	NA	NA
Asian	0.051	-0.061*	NA	NA	NA	NA
Pacific Islander	-0.011	-0.002	NA	NA	NA	NA
Filipino	-0.036	-0.023	NA	NA	NA	NA
Native American	-0.053*	-0.074*	-0.096*	-0.066*	-0.032	-0.166*
English Learner	a	a	a	a	a	a
Residential Status	0.125*	0.187*	0.223*	0.142*	0.088*	-0.115
Parental home	-0.107*	-0.148*	-0.164*	-0.100*	-0.073*	-0.227*
Foster family home	a	a	a	a	a	a
Other residential	0.016	0.036*	0.066*	0.027	-0.021	0.046
Disability	0.050	0.035	0.103*	0.029	-0.041	0.113
SLI	0.154*	0.048	0.157*	0.075	0.055	0.150
MR	-0.338*	-0.367*	-0.326*	-0.394*	-0.285*	-0.343*
HH	0.015	-0.007	0.040	0.004	-0.016	-0.108
DEAF	-0.191*	-0.248*	-0.233*	-0.234*	-0.133*	-0.335*
SLD	0.242*	0.161*	0.307*	0.171*	0.038	0.210*
VI	-0.089*	-0.184*	-0.177*	-0.129*	-0.096*	-0.093
ED	0.651*	0.671*	0.693*	0.655*	0.404*	NA
OI	0.375*	0.000	0.359	0.117	0.033	0.253
OHI	0.165*	0.099	0.192*	0.108*	0.058	0.144
EMD	0.260*	0.156*	0.153*	0.182*	0.075*	0.289*
DB	-0.118*	-0.174*	-0.149*	-0.160*	-0.084*	NA
MD	a	a	a	a	a	a
AUT	0.018	0.042*	0.015	0.048	0.025	0.080
TBI	-0.033	-0.034	-0.051*	-0.031	0.001	-0.084
Geographic Region	-0.059*	-0.057*	-0.083*	-0.049*	-0.017	-0.080
Los Angeles	0.029	0.061	-0.019	0.118	0.326*	0.023
Bay Area	-0.081*	-0.075*	-0.078*	-0.095*	-0.028*	-0.091*
Sacramento	-0.016	0.014	0.018	-0.011	-0.003	-0.033
San Joaquin Valley	0.012	0.016	0.006	0.020	0.008	-0.035
Rural	0.028	0.038	0.040	0.020	-0.008	0.150*
Inland Empire						
Santa Barbara						
San Diego						
Orange						
District Characteristics						

African American (%)	0.003*	0.004*	0.004*	0.005*	0.002*	0.007*
Asian (%)	0.002*	0.001*	0.002*	0.002	0.000	0.002
Hispanic (%)	-0.001*	-0.001	-0.001	-0.003*	-0.001	0.000
Other race/ethnic (%)	-0.001	-0.003*	0.001	-0.004*	-0.004*	-0.002
English Learner (%)	-0.005*	-0.005*	-0.006*	-0.005*	-0.002*	-0.007*
Free/reduced lunch (%)	0.002*	0.002*	0.003*	0.002*	0.001	0.003*
District enrollment	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*
District urban	0.077*	0.084*	0.092*	0.062	0.108*	0.072
District suburban	0.039	0.067	0.059	0.036	0.094*	0.081
Early Identification Rate	0.259	0.300	0.287	0.298	0.191	0.367

NOTES: <sup>a</sup> indicates omitted reference category. NA indicates that the cell entry is not applicable. \* indicates statistical significance at the .05 level. Source: CASEMIS, June, 2005-2006. The disability categories are mental retardation (MR), hard of hearing (HH), deafness (DEAF), speech or language impairment (SLI), visual impairment (VI), emotional disturbance (ED), orthopedic impairment (OI), other health impairment (OHI), established medical disability (EMD), specific learning disability (SLD), deaf-blindness (DB), multiple disability (MD), autism (AUT), and traumatic brain injury (TBI).

**Figure 1—Number of New Entrants to the California Special Education Population Identified Before and After Kindergarten Entry, by Disability, 2005-2006**

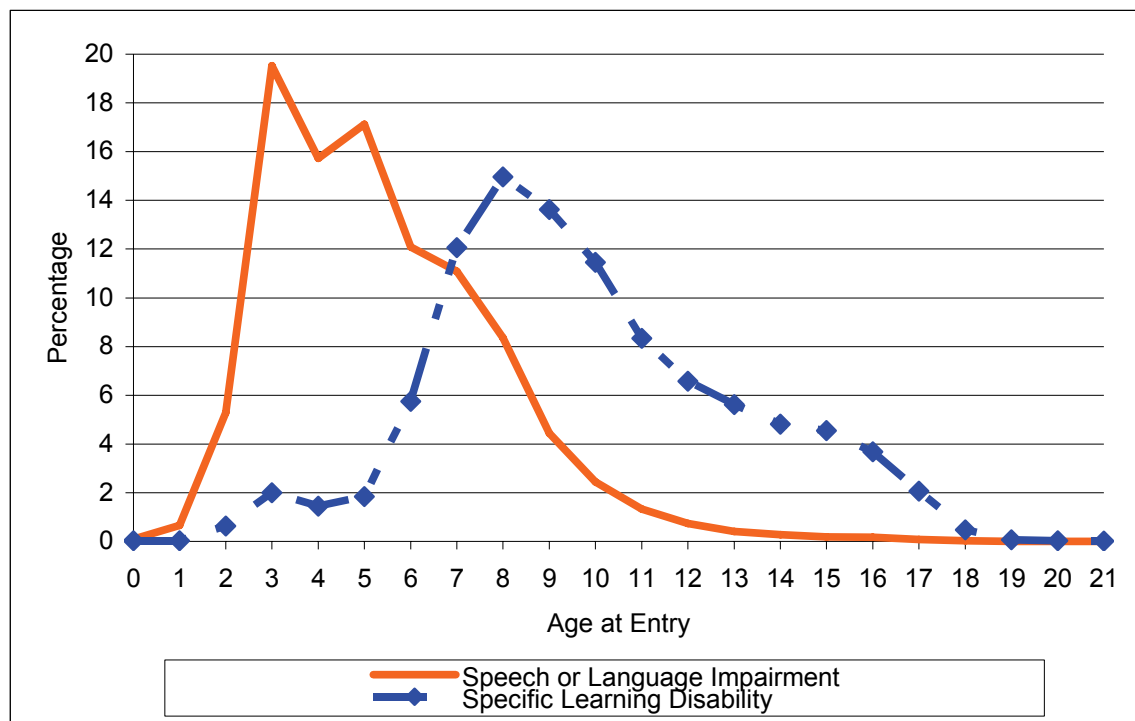


SOURCE: CASEMIS, June, 2005-2006.

NOTE: The disability categories are mental retardation (MR), hard of hearing (HH), deafness (DEAF), speech or language impairment (SLI), visual impairment (VI), emotional disturbance (ED), orthopedic impairment (OI), other health impairment (OHI), established medical disability (EMD), specific learning disability (SLD), deaf-blindness (DB), multiple disability (MD), autism (AUT), and traumatic brain injury (TBI).

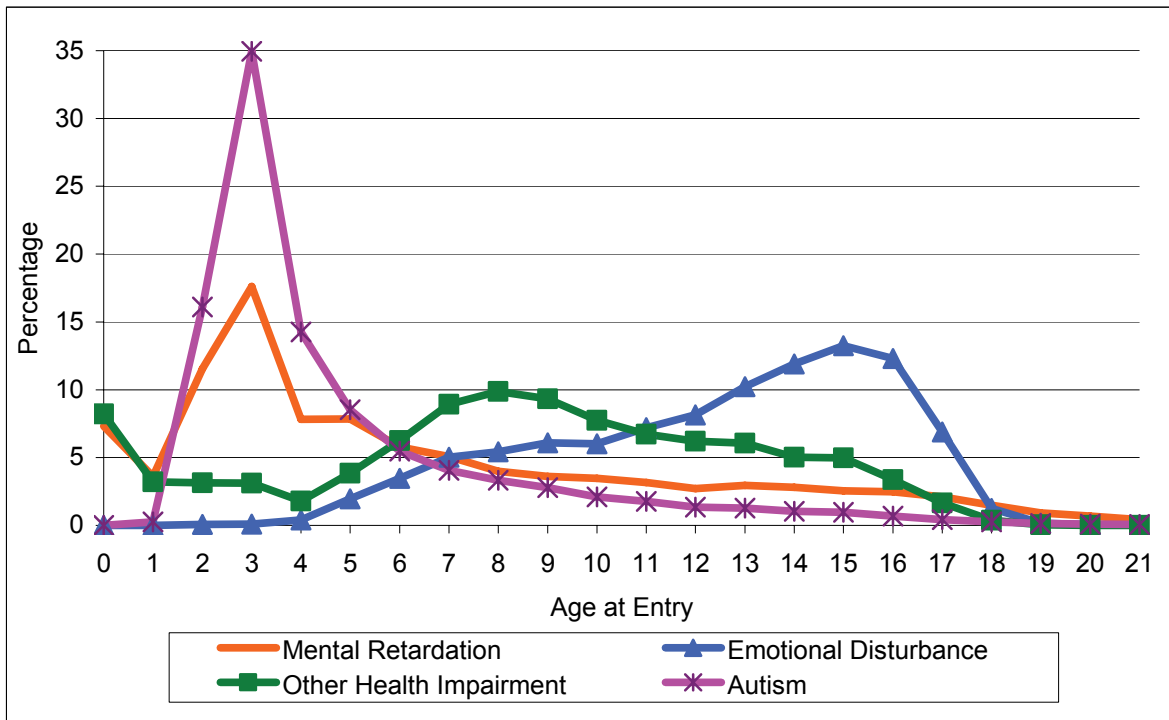


**Figure 2A—Percentage of Children Diagnosed at Various Ages with SLI and SLD**



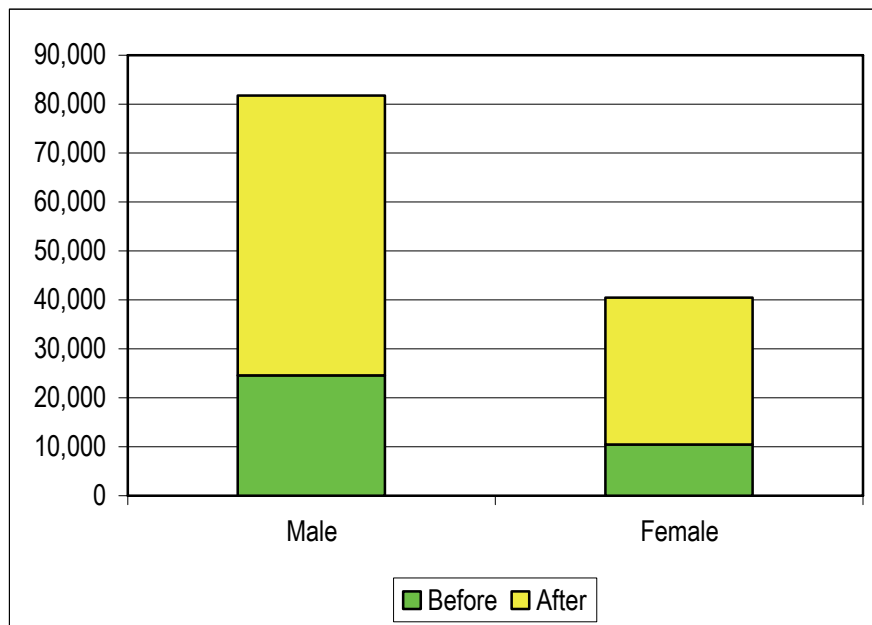
SOURCE: CASEMIS, June, 2005-2006.

**Figure 2B—Percentage of Children Diagnosed at Various Ages with MR, ED, OHI, and AUT**



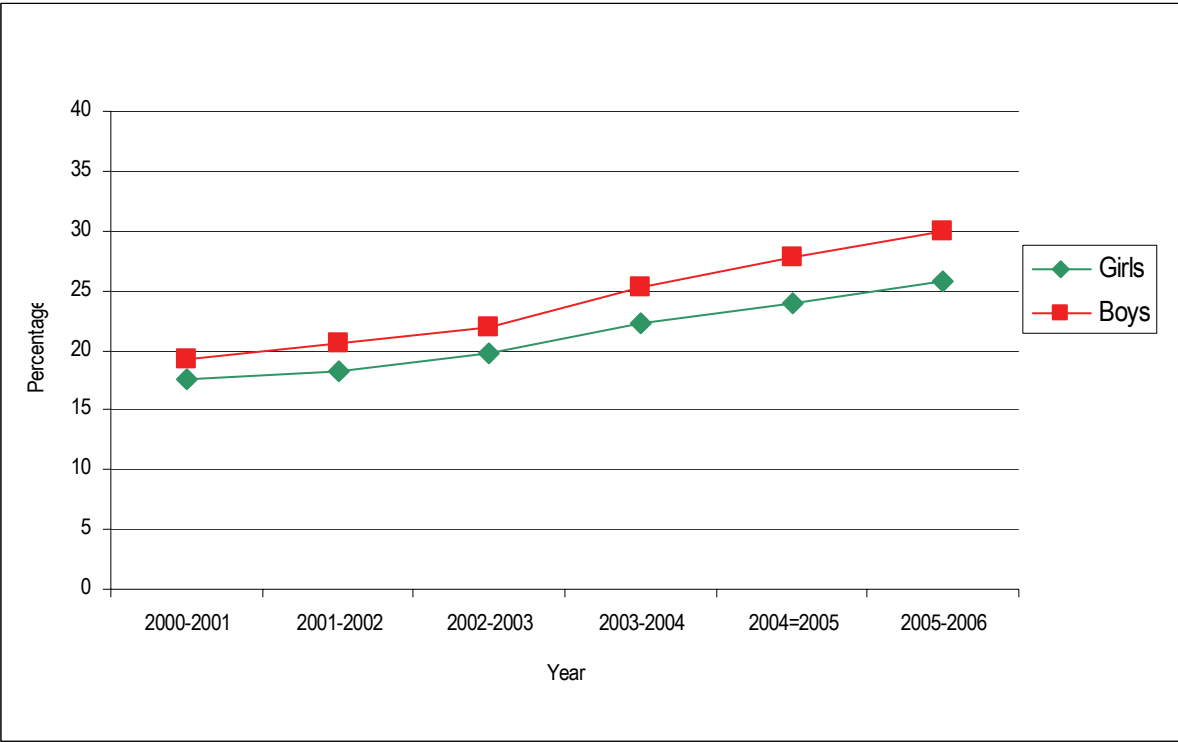
SOURCE: CASEMIS, June, 2005-2006.

**Figure 3— Number of New Entrants to the California Special Education Population Identified Before and After Kindergarten Entry, by Gender, 2005-2006**



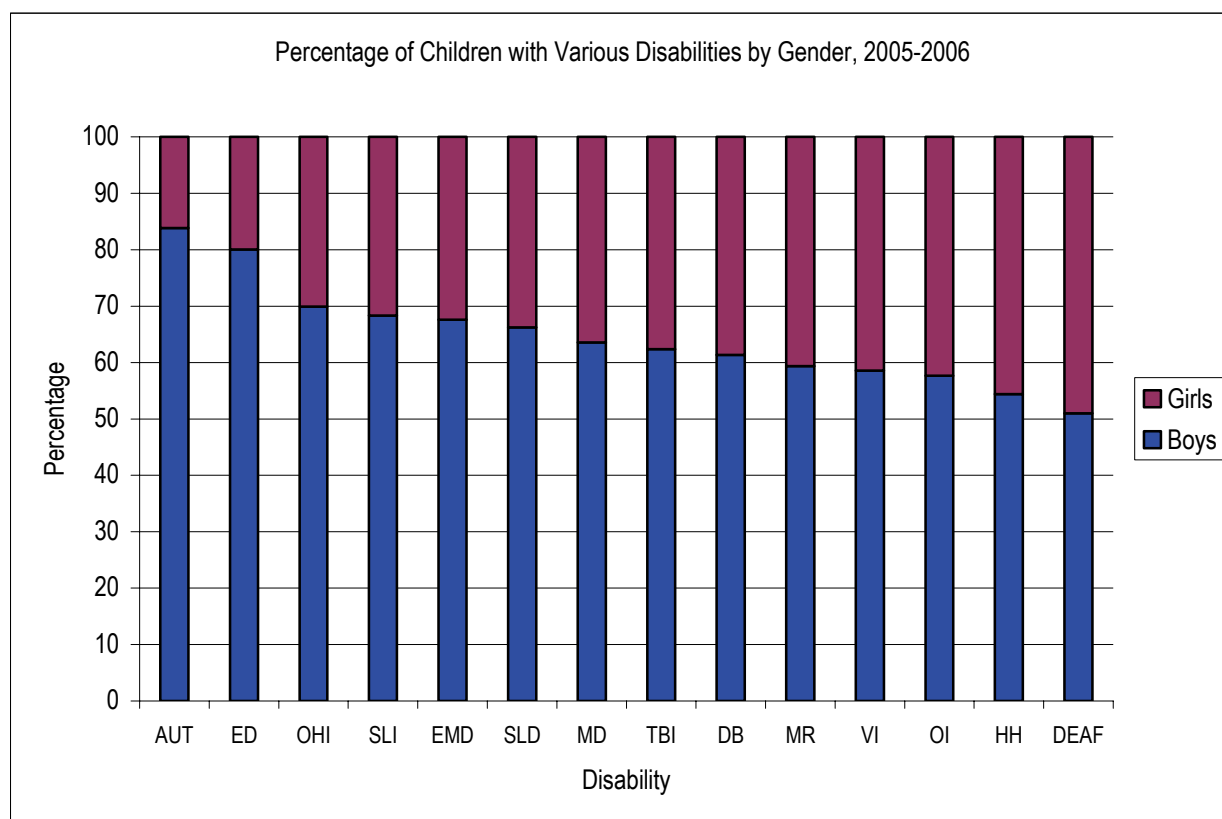
SOURCE: CASEMIS, June, 2005-2006.

**Figure 4—Percentage of New Entrants to the California Special Education Population who are Identified Before Kindergarten Entry, by Gender 2000 through 2006**



SOURCE: CASEMIS, June, 2005-2006.

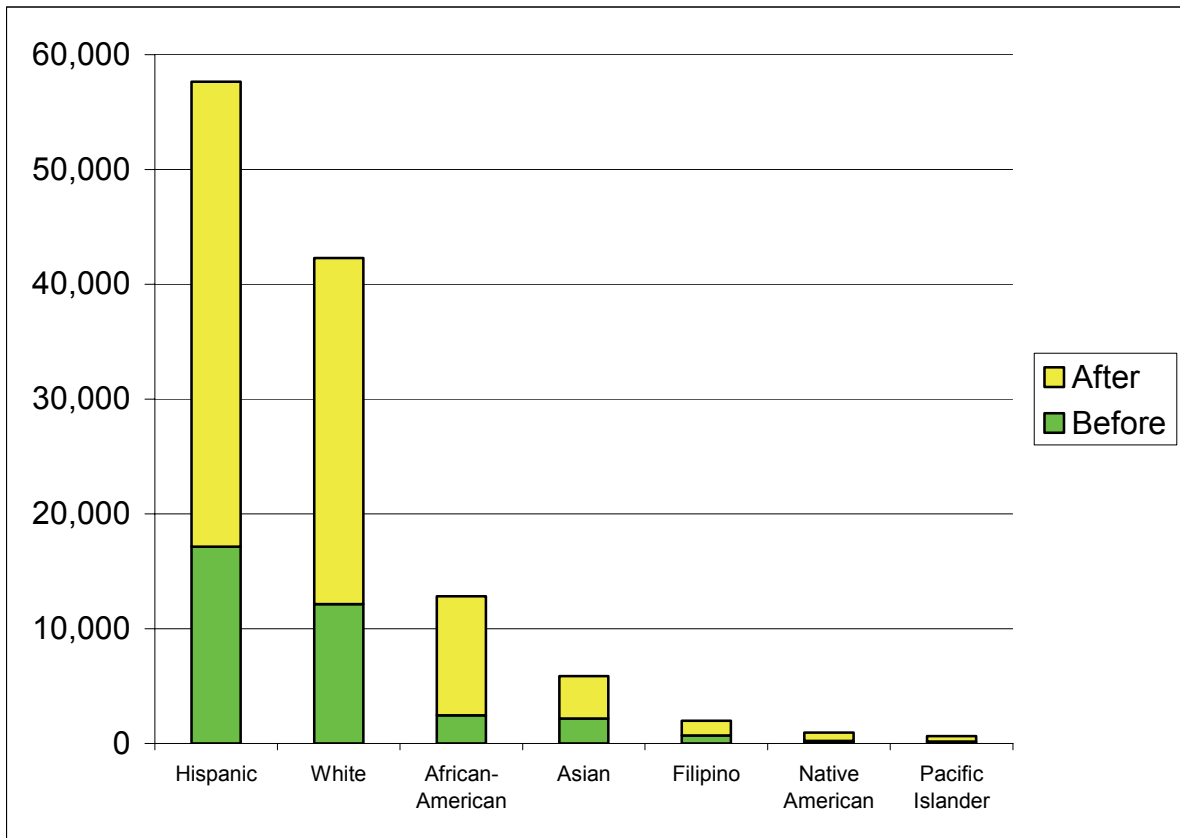
**Figure 5—Percentage of New Entrants to the California Special Education Population with Various Disabilities, by Gender, 2005-2006**



SOURCE: CASEMIS, June, 2005-2006.

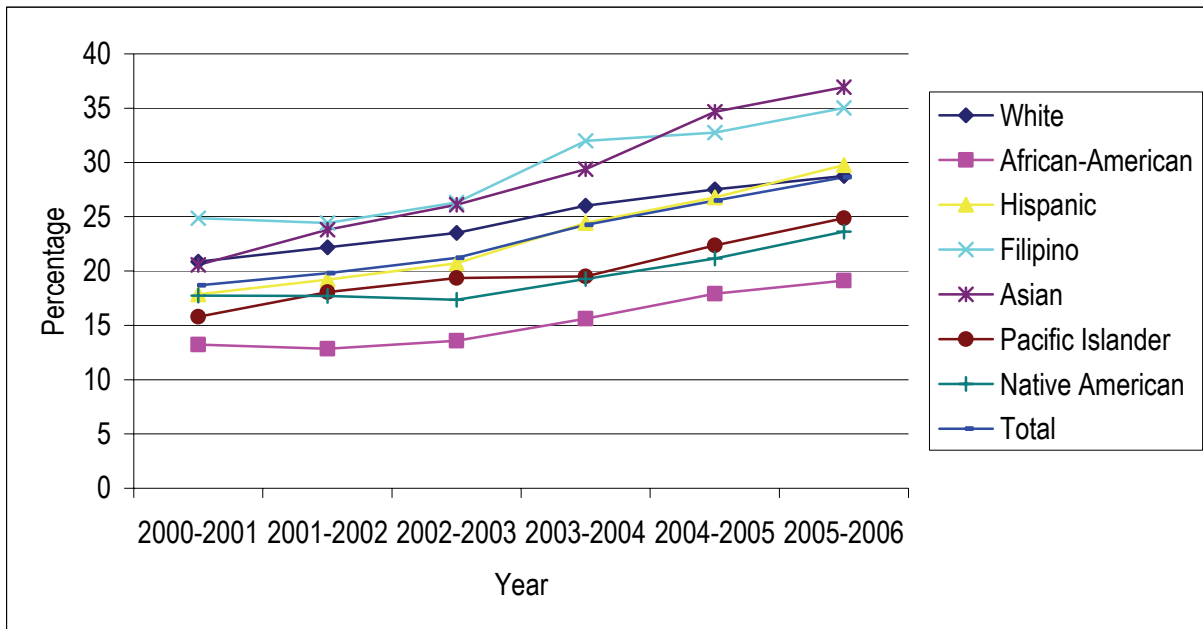
NOTE: The disability categories are mental retardation (MR), hard of hearing (HH), deafness (DEAF), speech or language impairment (SLI), visual impairment (VI), emotional disturbance (ED), orthopedic impairment (OI), other health impairment (OHI), established medical disability (EMD), specific learning disability (SLD), deaf-blindness (DB), multiple disability (MD), autism (AUT), and traumatic brain injury (TBI).

**Figure 6– Number of New Entrants to the California Special Education Population Identified Before and After Kindergarten Entry, by Race/Ethnicity, 2005-2006**



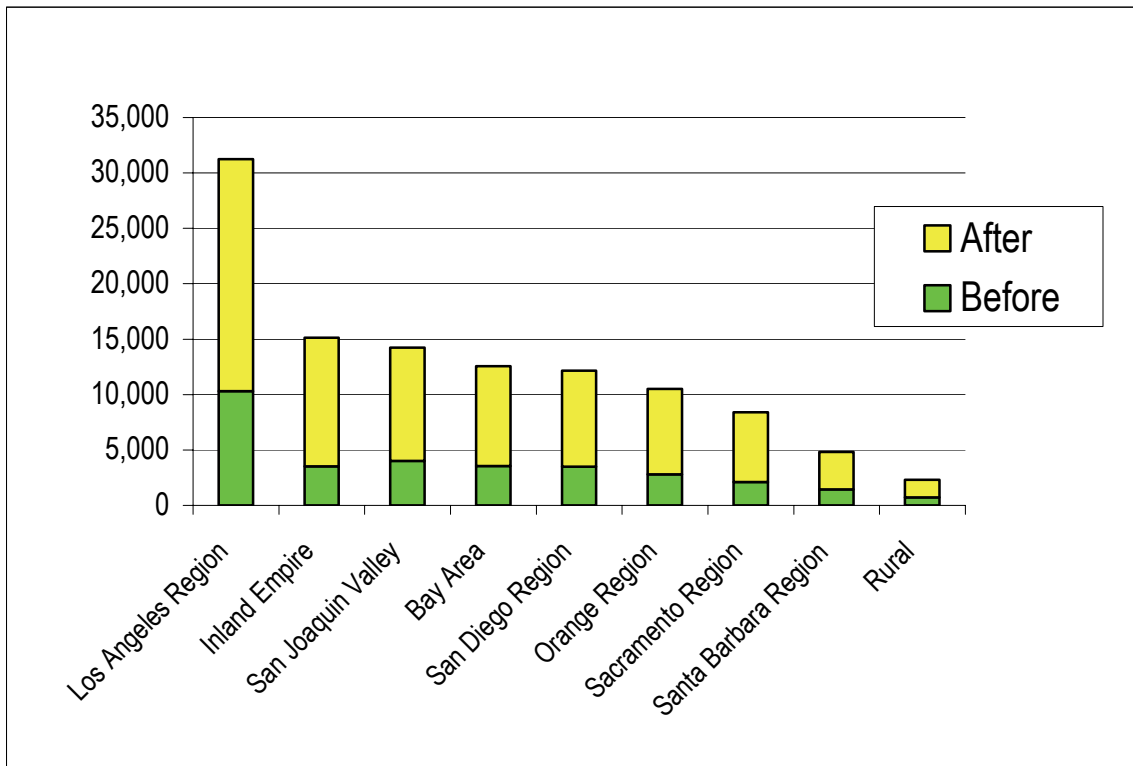
SOURCE: CASEMIS, June, 2005-2006.

**Figure 7—Percentage of New Entrants to the California Special Education Population Identified Before Kindergarten Entry, by Race/Ethnicity, 2000 through 2006**



SOURCE: CASEMIS, June, 2005-2006.

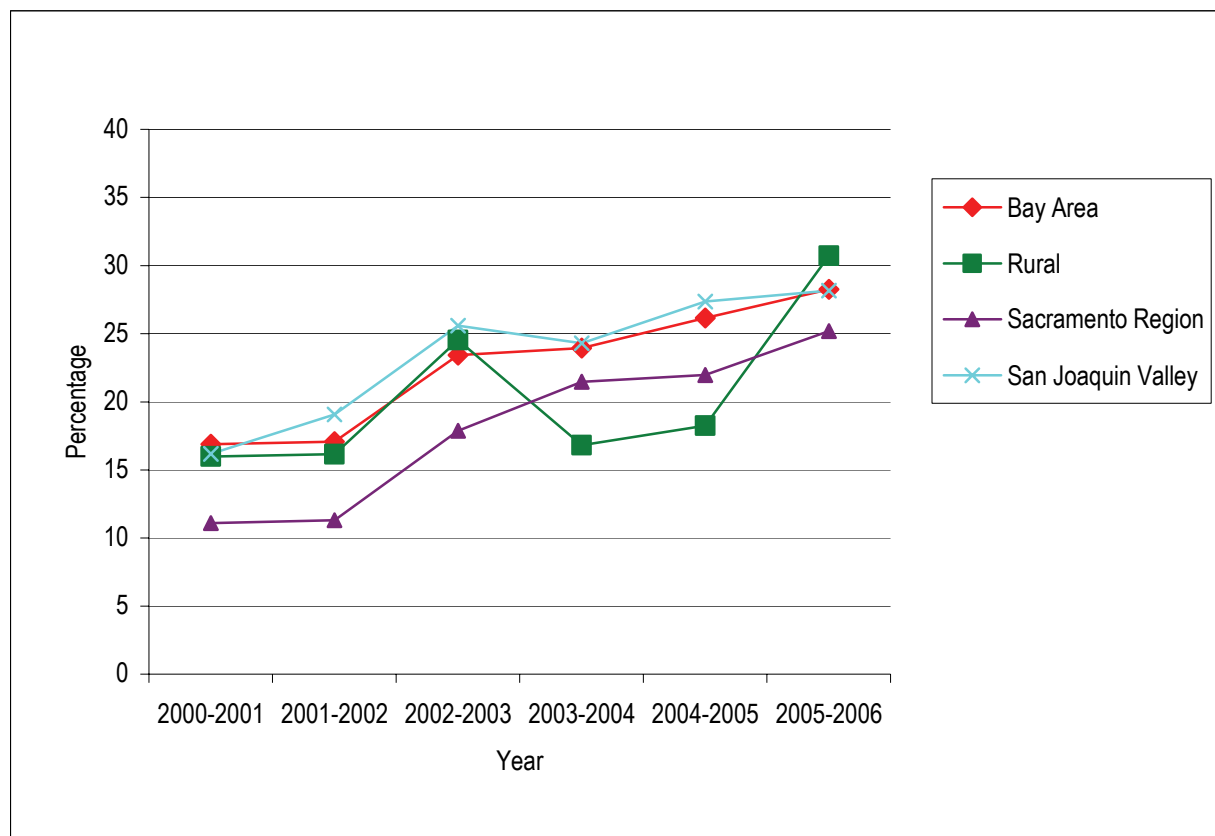
**Figure 8– Number of New Entrants to the California Special Education Population Identified Before and After Kindergarten Entry, by Region, 2005-2006**



SOURCE: CASEMIS, June, 2005-2006 and regional grouping information.

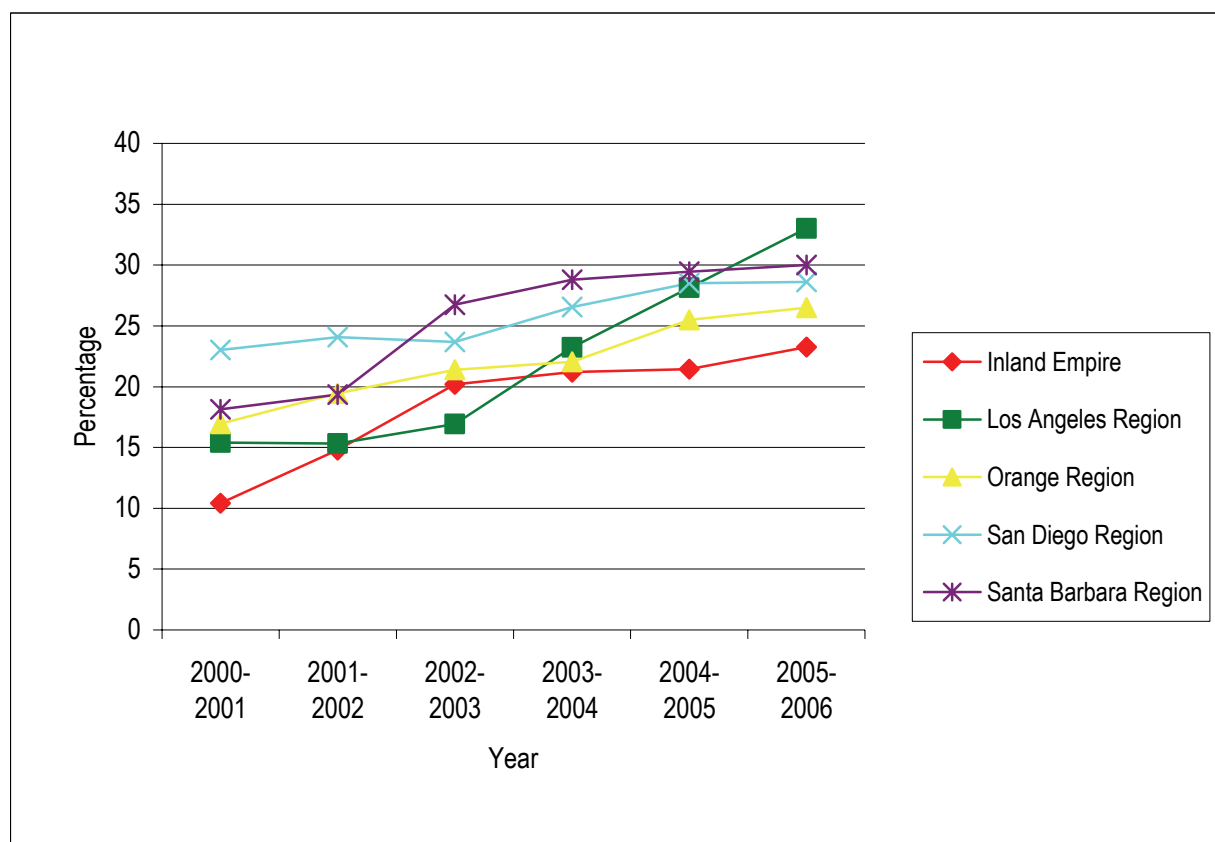


**Figure 9A—Percentage of New Entrants to the California Special Education Population Identified Before Kindergarten Entry, by Region (Northern California and Rural), 2000 through 2006**



SOURCE: CASEMIS, June, 2005-2006 and regional grouping information.

**Figure 9B—Percentage of New Entrants to the California Special Education Population Identified Before Kindergarten Entry, by Region (Southern California), 2000 through 2006**



SOURCE: CASEMIS, June, 2005-2006 and regional grouping information.